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Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites

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Prepared for the
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ABSTRACT

This *Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Waste Area Group 1, Operable Unit 1-10, Group 2 Sites* was developed to implement the early remedial action portions of the selected remedy, as stated in the *Final Record of Decision for the Test Area North, Operable Unit 1-10* and the *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10.* The two sites addressed in this Remedial Design/Remedial Action Work Plan Addendum are Technical Support Facility (TSF) -09—comprised of Tanks V-1, V-2, and V-3—and TSF-18 comprised of Tank V-9. Collectively, the sites are referred to as the V-Tanks. As presented in the *Final Record of Decision for Test Area North, Operable Unit 1-10*, the two sites pose a threat to human health and the environment. The *Final Record of Decision for Test Area North, Operable Unit 1-10* and the *Explanation of Significant Differences for the Record of Decision for Test Area North Operable Unit 1-10* determined the selected remedy for the sites as soil and tank removal, ex situ treatment of tank contents, and disposal of the removed material. The early remedial action consists of sand filter relocation, isolation of V-9 from TAN-616 lines, and soil sampling. This Remedial Design/Remedial Action Work Plan Addendum describes the Remedial Design/Remedial Action Work Plan for the early remedial action and cites supporting documents required to conduct this remedial action.

CONTENTS

ABSTRACT iii

ACRONYMS ix

1. INTRODUCTION 1-1

1.1 Work Plan Organization 1-2

1.2 Background 1-3

1.2.1 Area Background 1-3

1.3 Early Remedial Action Implementation Approach 1-7

2. DESIGN BASIS 2-1

2.1 Remedial Action Objectives 2-1

2.2 Early Remedial Action Performance Objectives 2-1

2.3 Design Objectives 2-2

2.4 Regulatory Requirements 2-3

2.4.1 Applicable or Relevant and Appropriate Requirements 2-3

2.5 U.S. Department of Energy-Related Orders and Standards 2-3

2.6 Industrial Standards 2-3

2.7 Idaho National Engineering and Environmental Laboratory Requirements and Documents 2-10

3. UNCERTAINTY MANAGEMENT 3-1

3.1 Encountering Unexpected/Detected Underground Utilities 3-1

3.2 Ability to Fully Characterize the Area of Contamination by Drilling 3-1

3.3 Schedule Contingencies 3-1

4. REMEDIAL DESIGN 4-1

4.1 Design Assumptions for the Early Remedial Action 4-1

4.1.1 Tank Isolation and Sand Filter Relocation Assumptions 4-1

4.2 Design Criteria 4-2

4.3 Technical Elements 4-2

4.3.1 V-9 Tank Isolation and Sand Filter Relocation 4-2
4.3.2 Area of Contamination Sampling 4-2

4.4 Quality Assurance 4-2

5. Environment, Safety, and Health 5-1

6. REMEDIAL ACTION WORK PLAN 6-1

6.1 Project Controls 6-1

6.1.1 Field Oversight and Construction Management 6-1
6.1.2 Project Cost Estimate 6-1
6.1.3 Project Schedule and Deliverables 6-1

6.2 Remedial Action Work Tasks 6-1

6.2.1 Access Control 6-2
6.2.2 Premobilization 6-2
6.2.3 Remediation Activities 6-3

6.3 Waste Management and Transportation 6-6

6.4 Inspections 6-7

6.5 Supporting Documents 6-7

6.5.1 Early Remedial Action Field Sampling Plan 6-10
6.5.2 Health and Safety Plan 6-10
6.5.3 Waste Management Plan 6-10
6.5.4 Operations and Maintenance Plan 6-11
6.5.5 Institutional Control Plan 6-11
6.5.6 Spill Prevention and Response Program 6-11

7. CHANGES TO REMEDIAL DESIGN/REMEDIAL ACTION SCOPE OF WORK AND GROUP 2 REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN 7-1

8. INSTITUTIONAL CONTROLS, OPERATIONS AND MAINTENANCE, AND FIVE-YEAR REVIEW 8-1

9. REFERENCES 9-1

Appendix A—Safety Category Designation and Record A-1

Appendix B—Remedial Action Cost Estimate B-1

Appendix C—V-Tanks' Characterization Sampling Data C-1

Appendix D—Agency Response Comments D-1

FIGURES

1-1. Test Area North V-Tank sites 1-4

1-2. Area of contamination and site structures 1-6

6-1. The V-Tank line inspection and relocation—plan view 6-4

6-2. The V-Tank line inspection and relocation—cross-sectional view 6-5

TABLES

1-1. Waste Area Group 1, Operable Unit 1-10 sites requiring remediation. 1-1

2-1. Applicable or relevant and appropriate requirements for the V-Tanks' (TSF-09 and TSF-18) early remedial action. 2-4

6-1. Working schedule and deliverables for the Operable Unit 1-10 Group 2 early remedial action. ... 6-2

6-2. Proposed waste handling and packaging for remediation waste 6-8

ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D&D	deactivation, decontamination, and decommissioning
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EDF	Engineering Design File
EPA	U.S. Environmental Protection Agency
ERA	early remedial action
FY	fiscal year
HASP	Health and Safety Plan
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
LLW	low-level waste
MCP	management control procedure
MLLW	mixed low-level waste
NA	not applicable
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
OU	operable unit
OSHA	Occupational Safety and Health Act

PCB	polychlorinated biphenyl
PDD	program description document
PLN	plan
PRD	program requirements document
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
ROD	Record of Decision
SAR	Safety Analysis Report
SSSTF	Staging, Storage, Sizing, and Treatment Facility
STD	standard
SVOC	semivolatile organic compound
TAN	Test Area North
TCLP	toxicity characteristic leaching procedure
TEM	template
TSCA	Toxic Substances Control Act
TSF	Technical Support Facility
TSR	technical safety requirement
VCO	Voluntary Consent Order
VOC	volatile organic compound
WAG	waste area group
WRRTF	Water Reactor Research Test Facility
WSA	waste storage area

Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites

1. INTRODUCTION

In accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991) amongst the U.S. Department of Energy Idaho Operations Office (DOE-ID), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (hereinafter referred to as the Agencies), the DOE-ID submits this *Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites*. This Remedial Design/Remedial Action Addendum was established as a secondary document with a 30-day Agency review in the *Technology Evaluation Scope of Work for the V-Tanks, TSF-09/18, at Waste Area Group 1, Operable Unit 1-10* (DOE-ID 2002a). Under the current remediation management strategy outlined in the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991), the location identified for the remedial action is designated as Waste Area Group (WAG) 1, Operable Unit (OU) 1-10 at the Idaho National Engineering and Environmental Laboratory (INEEL).

As part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.), the release sites at Test Area North (TAN) OU 1-10 were evaluated in the *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1997). The Remedial Investigation/Feasibility Study assessed the investigations previously conducted for WAG 1, thoroughly investigated the sites not evaluated previously, and determined the overall risk posed by the WAG. The Remedial Investigation/Feasibility Study culminated with finalizing the *Final Record of Decision for Test Area North, Operable Unit 1-10* (DOE-ID 1999). The Record of Decision (ROD) identified eight sites requiring remedial action and delineated specific remedies for each. The eight sites requiring remediation in WAG 1 are divided into three groups to facilitate remediation, and as agreed to by the Agencies. The sites included in each group are presented in Table 1-1.

Table 1-1. Waste Area Group 1, Operable Unit 1-10 sites requiring remediation.

Group	Sites
1	Soil contamination area south of the turntable (TSF-06, Area B), fuel leak site (WRRTF-13), and PM-2A tanks' soil excavation (TSF-26)
2	V-Tanks (Tanks V-1, V-2, and V-3) and associated piping and equipment (TSF-09) and V-Tank (Tank V-9) and associated piping and equipment (TSF-18)
3	PM-2A tanks' contents removal (TSF-26) and the burn pits (WRRTF-01 and TSF-03)

TSF = Technical Support Facility
WRRTF = Water Reactor Research Test Facility

The early remedial action (ERA) for Group 2 sites is addressed in this Remedial Design/Remedial Action Work Plan Addendum. The *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10* (DOE-ID 2003a) describes the ERA as a first phase for remediation of the V-Tanks. The ERA will consist of the following activities:

- Isolating Tank V-9 and relocating the sand filter
- Sampling soil to further characterize the area of contamination (AOC) surrounding the V-Tanks.

Non-CERCLA components within the boundary of the Group 2 sites are managed under a Voluntary Consent Order (VCO) between the State of Idaho and DOE-ID to correct potential Hazardous Waste Management Act (HWMA)/Resource Conservation and Recovery Act (RCRA) noncompliance (Idaho Code § 39-4413). These VCO components will be removed concurrent with the Group 2 ERA in accordance with the RCRA-regulated VCO and are described in this Remedial Design/Remedial Action Work Plan Addendum for reference.

1.1 Work Plan Organization

This Group 2 Remedial Design/Remedial Action Work Plan Addendum presents the design and implementation strategy for the ERA portions of the ROD-selected remedy. As an addendum to the original *Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites* (DOE-ID 2002b), this document follows the same organization as the original. Detail found in the original Remedial Design/Remedial Action Work Plan has been omitted where it is unnecessary or inappropriate to describe the ERAs. General sections (such as "Background") are not repeated, but readers may refer to the original Remedial Design/Remedial Action Work Plan for this information. Specific requirements (such as Section 2, "Design Basis") are repeated so this document can stand alone concerning the ERA design and work plan. The following are brief descriptions of this addendum's sections and appendices:

- Section 1, "Introduction," describes the background and history of the Group 2 sites and gives an overview of the selected early remedy implementation addressed in this addendum.
- Section 2, "Design Basis," provides the ERA objectives, early-remedy-implementation performance objectives, and design objectives to be achieved by this document. This section lists the applicable or relevant and appropriate requirements (ARARs) and the compliance strategy to be implemented for each. Design codes, industrial standards, and INEEL and DOE-ID requirements for the ERAs also are presented.
- Section 3, "Uncertainty Management," identifies several project uncertainties and describes the project management approach to them.
- Section 4, "Remedial Design," presents a summary of the ERA design assumptions, criteria, technical design components, and safety category evaluation.
- Section 5, "Environmental, Safety, Health, and Quality," provides an overview of the approach for ensuring environmental compliance through the environmental checklist, worker safety and health through the Health and Safety Plan (HASP), and quality control through the quality level evaluation.

- Section 6, "Remedial Action Work Plan," presents the steps and documentation required to complete the ERA. Remedial action work tasks, supporting documents, and inspections are presented in this section.

- Section 7, "Changes to the Remedial Design/Remedial Action Scope of Work and Group 2 Remedial Design/Remedial Action Work Plan," discusses changes to the *Test Area North, Waste Area Group 1, Operable Unit 1-10, Remedial Design/Remedial Action Scope of Work* (DOE-ID 2000) and the Group 2 Remedial Design/Remedial Action Work Plan. This section discusses the 2003 ERA to the OU 1-10 ROD and related changes to the Remedial Design/Remedial Action Work Plan.

- Section 8, "Institutional Controls, Operations and Maintenance, and Five-Year Review," cites the original Remedial Design/Remedial Action Work Plan, because these elements are not part of the ERA.

- Section 9, "References," is a list of referenced material.

- Appendix A, "Safety Category Evaluation," presents the safety category designation for each component of the ERA.

- Appendix B, "Remedial Action Cost Estimate," provides an estimate of total projected costs for implementing the ERA.

- Appendix C, "Sampling Data," presents the historical sampling data for the V-Tanks' soil and sand filter contents.

- Appendix D, "Agency Comment Resolution Forms," provides the comment forms used to resolve draft and draft final comments received from the Agencies on this Remedial Design/Remedial Action Work Plan Addendum and associated documents.

1.2 Background

1.2.1 Area Background

For a full description of the INEEL and TAN's area background, see the original Group 2 Remedial Design/Remedial Action Work Plan (DOE-ID 2002b).

The ERA remediation sites addressed under this Group 2 Remedial Design/Remedial Action Work Plan Addendum are located at TAN Technical Support Facility (TSF) -09 and TSF-18 (i.e., the V-Tanks) and are situated in an open area east of TAN-616 and north of TAN-607 (see Figure 1-1). Soil contamination attributed to V-Tank activities surrounds these tanks. The AOC defined by the contaminated soil is estimated at 15.2 m (50 ft) by 24.4 m (80 ft) (DOE-ID 1999). Several non-CERCLA components are located within the AOC, which could impede access to the V-Tanks, including the TAN-1704 valve pit. The valve pit is associated with the former V-Tank operations.

Waste was transferred from the TAN-616 evaporator pit sump and pump room sump, the TAN-607 laboratory drain, the TAN-607 Warm/Hot Shop drain, and TSF-21 (Valve Pit #2) through the TAN-1704 valve pit (Valve Pit #1) to TSF-18 (Tank V-9). The overflow from Tank V-9 drained to TSF-09 (Tanks V-1, V-2, and V-3) (INEEL 2001a). Sections 1.2.1.1–1.2.1.3 provide brief descriptions of TSF-09, TSF-18, the contaminated soil attributable to both units, and the non-CERCLA components to be addressed in this Remedial Design/Remedial Action Work Plan Addendum. Details of the action are

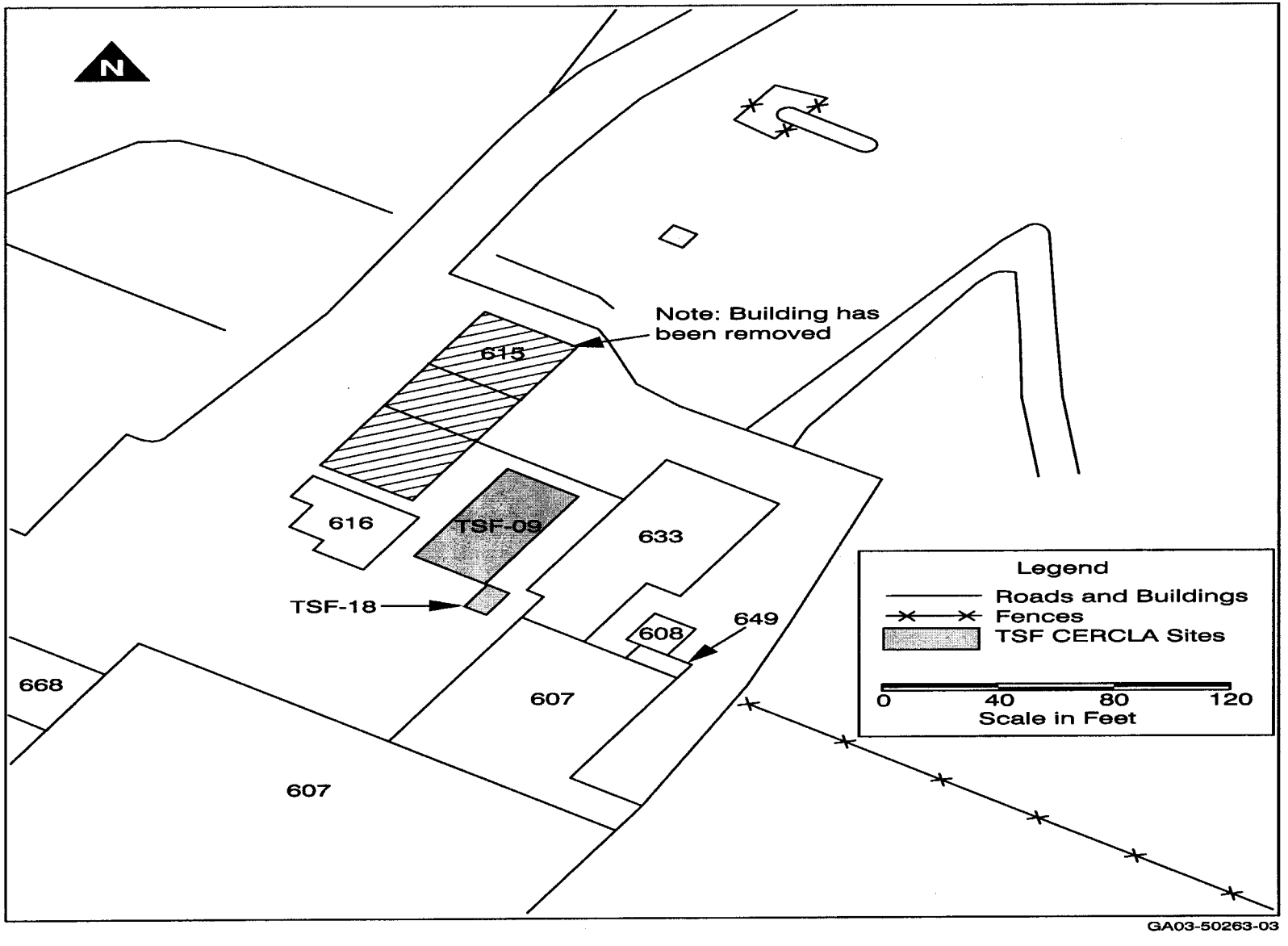

Figure 1-1. Test Area North V-Tank sites.

described in Section 6 and are shown in Figures 6-1 and 6-2. The other non-CERCLA components are discussed in detail in the *HWMA/RCRA Closure Plan for the TAN/TSF Intermediate-Level Radioactive Waste Management System—Phase I: Treatment Subsystem (TAN-616)* (DOE-ID 2003b). The following sections have been shortened to address only components related to the ERA.

Currently, TSF-09 and TSF-18 are administratively controlled. The site is fenced and posted with signs that identify it as a CERCLA site. No activities can be performed at the site without contacting the INEEL Idaho Completion Project directorate. Entry into the site requires radiological control precautions. The purpose of these controls is to keep worker exposures as low as reasonably achievable (ALARA) and to prevent the spread of contaminated soil (DOE-ID 1997).

1.2.1.1 **Sand Filter.** The sand filter, located adjacent to the south side of the V-1 metal riser culvert, is a component of TSF-18 (see Figure 1-2). Apparently, the sand filter was used to remove particulates from the Tank V-9 effluent. The filter is an aboveground concrete box containing approximately 19 L (5 gal) of material. The material in the sand filter is reported to resemble potting soil in color and texture. The concrete box has outer dimensions of approximately 1.5 m (5 ft) wide by 1 m (3 ft) deep by 1 m (3 ft) high. The concrete walls are 10 to 15 cm (4 to 6 in.) thick. The box resides on a concrete pad that is slightly wider than the outside dimensions. The structure's anecdotal history indicates that it was used for only 1 day in 1970 before it became plugged, and it has not been used since (DOE-ID 1997).

The contents of the sand filter were sampled in March 1997. Results indicate the presence of polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) below regulatory levels as well as concentrations of radionuclides. Tables C-1 and C-2 in Appendix C provide sample results associated with the sand filter's contents. Engineering Design File (EDF) -3477, "Criticality Concerns Associated with the TAN V-Tanks," indicates that a criticality evaluation performed on the sand filter contents determined that there is not sufficient U-235 present to pose a criticality concern.

Site TSF-18 is included in the posted, fenced area surrounding TSF-09. No activities can be performed at the site without contacting the Idaho Completion Project directorate. Entry into the sites requires radiological control precautions (DOE-ID 1997). Pipes associated with the sand filter were removed previously. No pipes are associated with the sand filter.

1.2.1.2 ***Contaminated Soil.*** The current AOC for the Group 2 sites is defined by the contaminated soil associated with TSF-09 and TSF-18 operations (see Figure 1-2) (DOE-ID 1999). The surface and subsurface contaminated soil resulted from spills that occurred when waste was transferred to and from tanks during the waste-disposal system operations. Additional contamination might have originated from windblown contaminant transport from the TSF-18 area. Historical interviews referenced in the *Preliminary Scoping Track 2 Summary Report for the Test Area North Operable Unit 1-05: Radioactive Contamination Sites* (ITC 1994) indicate that open casks were stored on a concrete cask storage pad. During storage and transportation operations, liquid waste from the casks might have spilled, resulting in shallow contamination of the pad area. Additional such references indicate that chemicals might have been applied in the TSF-09 and TSF-18 fenced area to kill weeds from approximately 1955 until as late as 1989.

Four soil-sampling events have been conducted at TSF-09 and TSF-18. Appendix C of this addendum presents tabulated analytical results and maps of sample locations. The extent of soil contamination is estimated conservatively based on sampling, radiation surveys, and geologic features. Currently, the horizontal extent is estimated to encompass an area of 15.2 × 24.4 m (50 × 80 ft). Vertical extent of contamination is known to extend to a depth of 6.7 m (22 ft) (DOE-ID 1997).

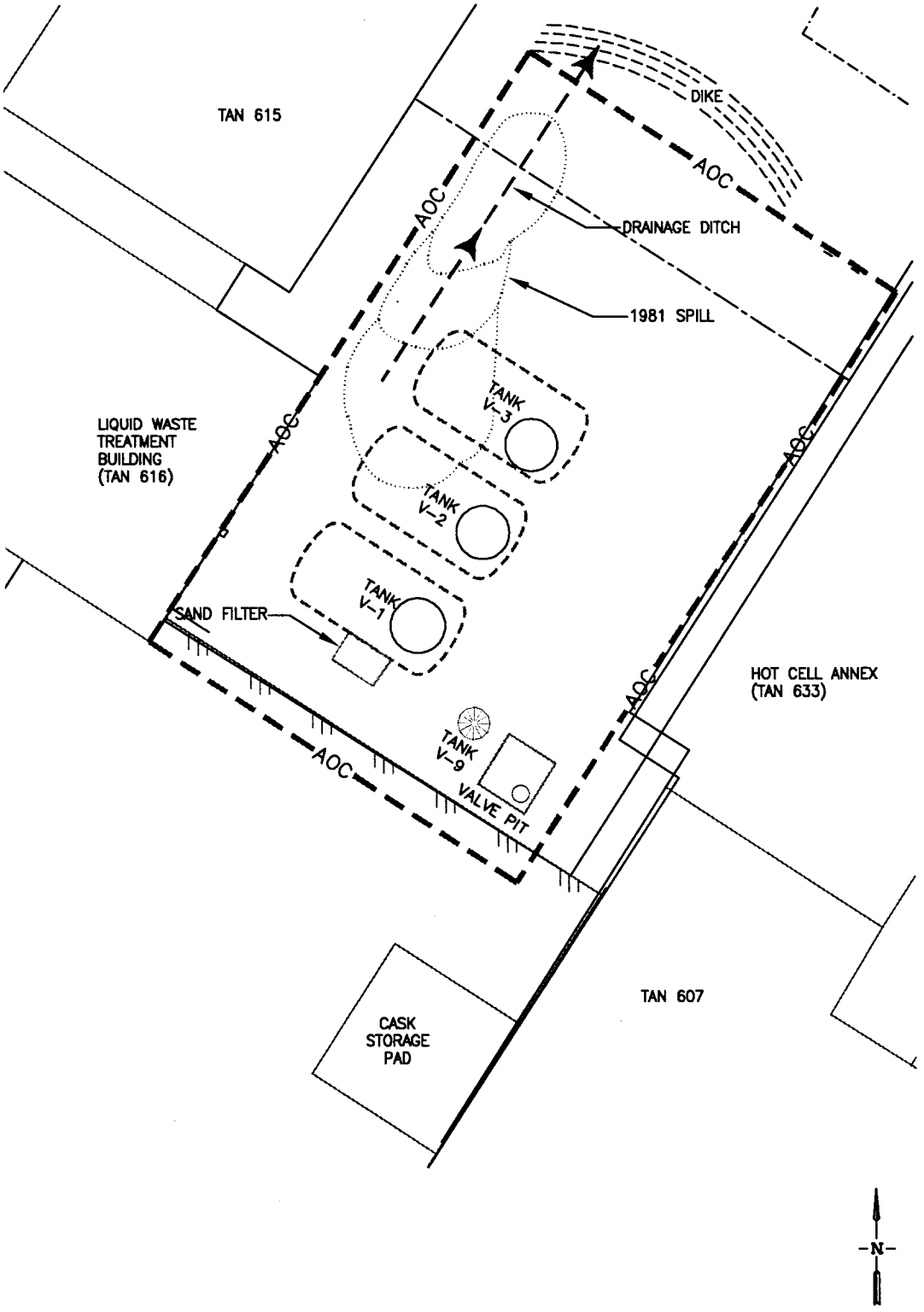

Figure 1-2. Area of contamination and site structures.

Additional soil has been added to the area during the past 20 years as a cover to contain radioactivity and reduce the potential for offsite migration. Contaminated soil may be buried 0.3 to 0.6 m (1 to 2 ft) below current ground surface. Previously, surface water flowed from the TSF-09 site into a drainage ditch flowing north from the site. In 1981, the drainage ditch was blocked after an accidental release from the pumping operations. Sampling of the ditch is included in the *Field Sampling Plan for V-Tanks Early Remedial Action at Waste Area Group 1, Operable Unit 1-10* (DOE-ID 2003c).

1.2.1.3 Non-Comprehensive Environmental Response, Compensation, and Liability Act Components. Several non-CERCLA components of the intermediate-level waste disposal system are located within the AOC's boundary. The TAN-1704 valve pit, influent lines, and additional piping that could impede access to the Group 2 sites will be removed concurrent with the ERA and will be managed in accordance with the VCO (Idaho Code § 39-4413). The INEEL VCO Program will fund the removal of VCO components.

The TAN-1704 valve pit was installed in 1953, and wastewater was routed through piping in the valve pit from the original TSF facilities. The unit became inactive in the late 1980s. The valve pit contains piping and valves that transferred low-level radioactive wastewater from the TSF facilities to Tank V-9, and later to TAN-616. The valve pit received wastewater from several influent lines. These lines were from the TAN-616 evaporator pit sump and pump room sump, TAN-607 laboratory drain, TAN-607 Warm/Hot Shop, and TSF-21 Valve Pit #2. In 1991, the lines from TAN-616 were cut and capped within the valve pit. The TAN-607 lines have remained open. However, the valves are closed at the valve pit, and material might have backed up in the lines. Lines from TSF-21 were truncated when the valve pit was removed. Effluent lines from the TAN-1704 valve pit drained to Tank V-9 (TSF-18). These lines were cut and rerouted to TAN-616, while the two pipes to Tank V-9 were capped within the valve pit in 1991. Outside the valve pit, the effluent lines are designated as part of the CERCLA-managed TSF-18 (INEEL 2001a).

The internal dimensions of the concrete valve pit are 1.5 m (5 ft) × 1.6 m (5.3 ft) × 2.9 m (9.5 ft) in depth. Access to the valves is by a manhole. The calculated internal volume of the valve pit is 7,170 L (1,895 gal). Approximately 0.3 m (1 ft) of liquid (approximately 760 L [200 gal]) was noted in the base of the valve pit during the 2000/2001 Deactivation, Decontamination, and Dismantlement/VCO characterization effort. The liquid was presumed to be from precipitation. A liquid sample was collected and analyzed for total VOCs, toxicity characteristic leaching procedure (TCLP) VOC, TCLP inorganics, TCLP SVOCs, PCBs, and radionuclides. With the exception of estimated trace values reported for trichloroethene and 2-hexanone, the sample results indicate that the liquid contains only radionuclides (Ce-144, Cs-137, Co-60, Sr-90, and gross beta activity) (INEEL 2001b). The TAN-1704 valve pit and its contents are being closed under the HWMA/RCRA Closure Plan (DOE-ID 2003b).

1.3 Early Remedial Action Implementation Approach

The Agencies have selected the remedy for the OU 1-10 V-Tank site addressed in this Remedial Design/Remedial Action Work Plan Addendum based on CERCLA requirements, the detailed analysis of alternatives, and public comments. The remedy—as selected in the 1999 ROD (DOE-ID 1999) and augmented by the Explanation of Significant Differences (DOE-ID 2003a)—consists of removing soil and tank contents, treating tank contents ex situ onsite, and disposing of tanks, tank contents, and ancillary piping and equipment. The ERA is a subset of this remedy. This section describes the general approach to be implemented for the ERA of the V-Tanks. Details of the ERA are located in Section 6. The major activities of the selected remedy for the V-Tanks ERA includes:

- Isolating Tank V-9 and relocating the sand filter.

- Removing debris (such as concrete tank cradles and piping) that would interfere with excavation to isolate Tank V-9:
  - Inspecting piping remotely.
  - Relocating the sand filter.
  - Excavating area (as necessary to access pipes).
  - Isolating piping from Tank V-9.
  - Flushing piping (if necessary).
  - Removing VCO piping (VCO place holder, not performed under this work plan).
  - Removing TAN-1704 valve pit packaging and disposing of related waste (VCO place holder, VCO work not performed under this work plan).
  - Characterizing removed material for waste disposal.
  - Loading and transporting waste to the INEEL CERCLA Disposal Facility (ICDF) or other appropriate facility for disposal.
  - Backfilling excavation.
  - Contouring and grading area to provide appropriate site drainage.
- Sampling soil to further characterize the V-Tanks' AOC:
  - Further characterizing the horizontal and vertical extent of soil contamination in the area surrounding TSF-09 and TSF-18 and migration pathways. No contaminated soil will be remediated as part of the ERA. Soil will be remediated in Fiscal Year (FY) 2006 as part of the V-Tank remediation effort.

2. DESIGN BASIS

This section identifies objectives that govern the ERA design. This includes the objectives defined by the ROD (DOE-ID 1999), the major components required for ERA aimed at meeting ROD and Explanation of Significant Differences' objectives, and the bounding INEEL objectives. Standards (STDs), requirements, and codes incorporated in the design also are presented.

2.1 Remedial Action Objectives

To meet the OU 1-10 remedial action objectives, final remediation goals for the contaminants of concern were established to ensure a risk-based protectiveness of human health and the environment, providing unrestricted land use in 100 years. These goals are quantitative cleanup levels based on ARARs and risk-based doses. As outlined in the ROD (DOE-ID 1999), the remedial action objective for the V-Tanks is as follows:

- Prevent release of the V-Tank contents to the environment.

The remedial action objective for the soil pathway is as follows:

- Reduce risk from external radiation exposure from Cs-137 to a total excess cancer risk of less than 1 in 10,000 for the hypothetical resident 100 years in the future and for the current and future worker.

2.2 Early Remedial Action Performance Objectives

Remedy performance objectives for the ERA at the V-Tanks have been identified as part of this Remedial Design/Remedial Action Work Plan Addendum to achieve and augment the remedial action objectives. The remedy performance objectives for the ERA at the V-Tanks are found in Section 2.2 of the original Remedial Design/Remedial Action Work Plan (DOE-ID 2002b). This section discusses ERA performance objectives, which are intermediate to the final remedy performance objectives. The ERA will be conducted in compliance with the ERA's ARARs presented in Section 2.4.

Flushing the pipes leading to Tank V-9 (if they contain liquids), then capping the pipes, ensures that additional water cannot enter Tank V-9 from this piping. Flushing may be performed if liquid or sludge is observed. The flush would be from the V-9 outlet through "downstream" piping via the valve system in the TAN-616 basement into Tank V-1 or V-2 for proper management. This is further discussed in Section 6 and shown in Figure 6-2. This action ensures that:

- Added liquid cannot enter V-9 (as stated)

- No waste in V-9 can enter the piping system to accumulate in TAN-616.

Placing this additional liquid in Tanks V-1 and V-2 will not have a negative impact on the remedial action for these tanks.

Isolation of V-Tanks 1, 2, and 3 from TAN-616 is provided by the existing valve system in the basement of TAN-616. These lines will be cut and capped in FY 2004 as part of the D&D&D of TAN-616 to enable subsequent, safe CERCLA remediation efforts on the tanks in FY 2005.

The sand filter has been isolated already. The ERA performance objectives include the following activities:

- Isolating the Tank V-9 and relocating the sand filter
  - Relocating the sand filter.
  - Potentially flushing lines, ensuring that no flush solution enters Tanks V-9 and V-3, or that no spills remain in TAN-616
  - Isolating piping to and from the TAN V-9 tank
  - Cutting and capping the piping between the TAN-1704 valve pit and Tank V-9
  - Ensuring no damage to Tank V-9.
- Sampling soil to further characterize the V-Tanks' AOC includes the following:
  - Identifying the AOC for regulatory purposes
  - Identifying the volume of soil that will require remediation
  - Generating data for ICDF Waste Acceptance Forms before soil removal.

2.3 Design Objectives

Design objectives have been identified as part of this Remedial Design/Remedial Action Work Plan Addendum to address project-specific constraints. The ERA's design objectives include the following:

- Buildings surrounding TSF-09 and TSF-18 and the tanks themselves must not be damaged. The design should ensure that the surrounding structures would not be affected by the remedial action.
- No waste liquid is to enter Tank V-9 or TAN-616 due to pipe isolation and flushing.
- Waste acceptance criteria for the ICDF or other appropriate disposal facilities and waste transportation will be considered throughout all activities associated with the ERA.
- Techniques to minimize the volume of waste generated will be used when health, safety, and cost considerations are not compromised.
- The design should provide for contingencies and changing conditions that might occur during the remedial actions.
- Engineering controls, as applicable, will be established to prevent the spread of contamination.

2.4 Regulatory Requirements

2.4.1 Applicable or Relevant and Appropriate Requirements

The ROD (DOE-ID 1999) presents the ARARs specific to the V-Tanks' remedial action. Table 2-1 summarizes the ROD-identified ARARs, relevancy, and how each requirement has been addressed in the remedial design or will be met during the remedial action. Table 2-2 presents additional applicable environmental regulations under consideration for the Explanation of Significant Differences (DOE-ID 2003a) and identifies how these ARARs will be addressed.

2.5 U.S. Department of Energy-Related Orders and Standards

The following are U.S. Department of Energy (DOE) orders and standards:

- DOE Order 231.1, "Environment, Safety, and Health Reporting"
- DOE Order 232.1A, "Occurrence Reporting and Processing of Operations Information"
- DOE Order 414.1A, "Quality Assurance"
- DOE Order 435.1, "Radioactive Waste"
- DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees"
- DOE Order 470.1, "Safeguards and Security Program"
- DOE Order 5400.5, "Radiation Protection of the Public and Environment"
- DOE Order 5480.4, "Environmental Protection, Safety, and Health Protection Standards"
- Program Description Document (PDD) -600, "INEEL Maintenance Management Program."

2.6 Industrial Standards

Industrial standards for specific remedial action work elements will be found in the following documents:

- National Fire Protection Association (NFPA) 70, "National Electric Code"
- NFPA 914, "Code for Protection of Historic Structures"
- Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846) (EPA 1997).

Table 2-1. Applicable or relevant and appropriate requirements for the V-Tanks' (TSF-09 and TSF-18) early remedial action.

Category/Citation	Control	Relevancy	Compliance Strategy
Action-Specific Applicable or Relevant and Appropriate Requirements			
Rules for the Control of Air Pollution in Idaho			
"Toxic Substances" (IDAPA 58.01.01.161) "Toxic Air Pollutants Non-Carcinogenic Increments" (IDAPA 58.01.01.585) and "Toxic Air Pollutants Carcinogenic Increments" (IDAPA 58.01.01.586)	Before construction begins, the release of carcinogenic and noncarcinogenic contaminants into the air must be estimated, and controlled (if necessary) and monitored when excavating soil, when flushing and during subsequent removal of piping, and when drilling and sampling soil.	Applicable	Releases of carcinogenic and noncarcinogenic contaminants into the air from the site are addressed in Appendix D of the original Remedial Design/Remedial Action Work Plan (DOE-ID 2002b). Modeling indicates that under worst case scenarios chemical and radionuclide concentrations will not come close to approaching IDAPA air quality limits, NESHAP limits for radionuclides, or OSHA permissible exposure limits. If any excavation is performed, air emissions will be monitored during excavation and dust-suppression measures will be used.
"Rules for Control of Fugitive Dust" (IDAPA 58.01.01.650) and "General Rules" (IDAPA 58.01.01.651)	Requires control of dust when excavating and removing piping and when drilling and sampling soil.	Applicable	Dust-suppression measures will be implemented (as necessary) during the remedial action to minimize generating fugitive dust, as indicated in the original Remedial Design/Remedial Action Work Plan (DOE-ID 2002b), Appendix B, "Design Specifications." These measures include water/surfactant sprays, keeping vehicle speeds to a minimum, and work controls during periods of high wind.
"Registration Procedures and Requirements for Portable Equipment" (IDAPA 58.01.01.500)	Portable equipment used for flushing the piping and drilling and sampling soil (and any portable support equipment) must be operated to meet state and federal air emission rules.	Applicable	When used, portable equipment will comply with the requirements of MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment," Section 4.2.8, or equivalent evaluation.
National Emission Standards for Hazardous Air Pollutants			
"National Emission Standards for Emissions of Radionuclide Other Than Radon from Department of Energy Facilities" (40 CFR 61, Subpart H)	Limits exposure of radioactive contamination release to 10 mrem/yr for the off-Site receptor and establishes monitoring and compliance requirements.	Applicable	Radionuclide emission calculations and air modeling are presented in Appendix D of the original Remedial Design/Remedial Action Work Plan (DOE-ID 2002b). The model resulted in an estimate of approximately 5E-7 mrem/yr dose at the INEEL fence line located 12 km (7.5 mi) northeast of TAN. The calculated emissions will

Table 2-1. (continued).

Category/Citation	Control	Relevancy	Compliance Strategy
"Emission Monitoring and Test Procedures" (40 CFR 61.93)			be included in the INEEL's annual NESHAP report, which determines the effective dose equivalent to members of the public. The ERA will be well within this bounding set of calculations.
"Compliance and Reporting" (40 CFR 61.94)			
Resource Conservation and Recovery Act – Standards Applicable to Generators of Hazardous Waste			
"Hazardous Waste Determination" (40 CFR 262.11) "Standards Applicable to Generators of Hazardous Waste" (IDAPA 58.01.05.006)	A hazardous waste determination is required for piping and any secondary waste generated during remediation. The subcontracted laboratory will manage the altered sample media.	Applicable	A hazardous waste determination will be based on an evaluation of existing sampling data and process knowledge to determine the characteristics of the waste. A preliminary determination is provided in the Waste Management Plan (INEEL 2003a).
"The Manifest" (40 CFR 262, Subpart B) "Standards Applicable to Generators of Hazardous Waste" (IDAPA 58.01.05.006)	Establishes requirements for transporting hazardous waste to the treatment or disposal site.	Applicable	Before transporting hazardous waste off-Site, uniform hazardous waste manifests will be prepared.
"Standards Applicable to Generators of Hazardous Waste" (Pre-Transportation Requirements) (IDAPA 58.01.05.006) (40 CFR 262.30–262.33)	Before transporting hazardous waste or offering hazardous waste for transportation off-Site, the generator must package, label, mark, and placard in accordance with the U.S. Department of Transportation's transportation regulations.	Applicable	The waste will be packaged, labeled, marked, and placarded for off-Site transportation.
RCRA – Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities			
"General Waste Analysis" (40 CFR 264.13[a][1–3]) (IDAPA 58.01.05.008)	Analysis requirements apply to the soil.	Applicable to soil before disposal.	Samples will be obtained to determine whether the generated waste material meets acceptance criteria for the designated disposal facility (or facilities).

Table 2-1. (continued).

Category/Citation	Control	Relevancy	Compliance Strategy
"Security of Site" (IDAPA 58.01.05.008) "Security" (40 CFR 264.14)	Access to the site must be restricted during excavation, removal of piping and associated components, and during drilling and soil sampling.	Applicable	The INEEL security measures, such as access restrictions, will be implemented during remediation activities. A temporary plastic fence may be used around the site's perimeter. Warning signs will be posted. Temporary barriers will be erected around the excavation.
"General Inspection Requirements" (40 CFR 264.15) (IDAPA 58.01.05.008)	Regular inspections must be performed during remediation.	Applicable	Routine inspections will be conducted during and following remediation. During remediation activities, inspections will be conducted to fulfill requirements of 40 CFR 264. After remediation, any waste in long-term on-Site storage will be inspected to meet the requirements of 40 CFR 264, though such storage is not currently anticipated.
"Personnel Training" (40 CFR 264.16) (IDAPA 58.01.05.008)	All personnel must be trained if they are to be involved in flushing the system piping, excavating and removing piping, and in drilling and sampling activities.	Applicable	The substantive requirements for training are listed in the Health and Safety Plan (INEEL 2003b). Personnel will be trained in hazardous waste management requirements.
"Preparedness and Prevention" (40 CFR 264, Subpart C) (IDAPA 58.01.05.008)	Applies to CERCLA waste storage areas.	Applicable	The requirements are communicated and maintained in the Appendix L to the contingency plan.
"Contingency Plan and Emergency Procedures" (40 CFR 264, Subpart D) (IDAPA 58.01.05.008)	Applies to CERCLA waste storage areas.	Applicable	The requirements are communicated and maintained in the Appendix L to the contingency plan.
"Disposal or Decontamination of Equipment" (40 CFR 264.114) (IDAPA 58.01.05.008)	All equipment used during remediation must be decontaminated if hazardous waste is contacted.	Applicable	Equipment decontamination will be conducted in accordance with the project Health and Safety Plan (INEEL 2003b) or Field Sampling Plan (DOE-ID 2003c), as applicable. Equipment will not be decontaminated if it is to be disposed of.
"Use and Management of Containers" (40 CFR 264, Subpart I and 40 CFR 264.171–178) (IDAPA 58.01.05.008)	Applies to the soil, piping, and any secondary hazardous waste generated during remediation that is managed in containers.	Applicable	All onsite containers will be selected to ensure that waste is compatible with the container and that container integrity is maintained. Weekly inspections will be conducted. Secondary containment for all containers with free liquids will be used.

Table 2-1. (continued).

Category/Citation	Control	Relevancy	Compliance Strategy
"Closure and Post-Closure Care" (40 CFR 264.197[a]) (IDAPA 58.01.05.008)	Does not apply to ERA activities	Not applicable to the ERA	—
RCRA – Land Disposal Restrictions			
"Land Disposal Restrictions" (IDAPA 58.01.05.011) (40 CFR 268.40 [a][b][e])	—	Applicable	Hazardous waste will be treated, if necessary, to meet the land disposal requirements before land disposal.
"Treatment Standards for Hazardous Debris" (40 CFR 268.45[a][b][c][d]) (IDAPA 58.01.05.011)	Applies to piping and other debris.	Applicable	These alternative treatment standards will be considered for all debris items generated. Specifically, most items associated with equipment and piping removal will be shipped to the SSSTF for treatment as debris, if necessary, with subsequent placement into the ICDF.
"Universal Treatment Standards" (40 CFR 268.48[a]) (IDAPA 58.01.05.011)	—	Applicable	Applicable universal treatment standards will be met before land disposal.
"Alternative Treatment Standards for Contaminated Soil" (40 CFR 268.49) (IDAPA 58.01.05.011)	—	Applicable	The current approach does not include soil excavation for the ERA. If any soil is excavated, it will be replaced into the area of excavation for this ERA.
"Procedures for Planning and Implementing Off-Site Response Actions" 40 CFR 300.440	—	Applicable	Before off-Site disposal, EPA Region 10 will be consulted to ensure that any off-Site vendor selected to handle treatment and disposal will meet this requirement. The CERCLA off-Site policy is not required for ICDF treatment and disposal.
Toxic Substance Control Act – Polychlorinated Biphenyls			
"PCB Remediation Waste" (40 CFR 761.61[b][1])	Applies to the sand filter and possibly some debris.	Applicable	The sand filter and possibly some debris will be disposed of as remediation waste. Disposal will be to the ICDF or other appropriate facility.

Table 2-1. (continued).

Category/Citation	Control	Relevancy	Compliance Strategy
"Self-Implementing Decontamination Procedures" (40 CFR 761.79[c][1] and [2])	Applies to decontaminating piping and equipment that comes into contact with the tank waste.	Applicable	For debris consisting of piping and equipment, the current strategy will be to meet the waste acceptance criteria of the Treatment, Storage, and Disposal Facility (e.g., ICDF). Decontamination may be conducted according to applicable regulations and reduced to waste acceptance criteria levels acceptable to the ICDF or other appropriate facility.
"Decontamination Solvents" (40 CFR 761.79[d])	Applies to solvents used for decontamination.	Applicable	No solvent use is planned; however, if solvents are used for decontamination, the current strategy will be to meet the ICDF's waste acceptance criteria.
"Limitation of Exposure and Control of Releases" (40 CFR 761.79[e])	Applies to all persons who will be conducting decontamination activities on piping and drilling and sampling equipment.	Applicable	For personnel performing decontamination activities, the workers will comply with this project's Health and Safety Plan.
"Decontamination Waste and Residues" (40 CFR 761.79[g])	Applies to decontaminating waste and residuals.	Applicable	For decontamination waste and residues, the current strategy will be to meet the ICDF's waste acceptance criteria. All liquids will be stabilized before shipment.
To-be-Considered Guidance			
Radiation Protection of the Public and the Environment			
DOE Order 5400.5, Chapter II (1)(a,b)	Limits the effective dose to the public from exposure to radiation sources and airborne releases.	TBC	Will be met by administrative and engineering controls as well as personnel real-time monitoring during isolation of Tank V-9. Excavated areas will be backfilled after closure. Job safety analyses and radiological work permits will be prepared for tasks that have potential for exposure to radioactive contamination/materials. Radiological work permits will only be used as determined by the radiological control technician, based on PRD-183, "INEEL Radiological Control Manual."

Table 2-1. (continued).

Category/Citation	Control	Relevancy	Compliance Strategy
Institutional Controls			
Region 10 Final Policy on Using Institutional Controls at Federal Facilities	Applies to contamination left in place or remaining above a 1E-04 risk.	TBC	Following the ERA, existing institutional controls will continue according to the institutional control requirements specified in the *Institutional Control Plan for the Test Area North Waste Area Group 1* (INEEL 2000). This plan documents current and future activities for implementing institutional controls in accordance with the *Final Record of Decision for Test Area North Operable Unit 1-10* (DOE-ID 1999) and was designed to meet the Region 10 final policy.

TBC = The TBCs are not classified as applicable or relevant and appropriate.
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CFR = *Code of Federal Regulations*
DOE-ID = U.S. Department of Energy Idaho Operations Office
EPA = U.S. Environmental Protection Agency
ICDF = INEEL CERCLA Disposal Facility
IDAPA = Idaho Administrative Procedures Act
INEEL = Idaho National Engineering and Environmental Laboratory
MCP = management control procedure
NESHAP = National Emission Standards for Hazardous Air Pollutants
PRD = program requirements document
RCRA = Resource Conservation and Recovery Act
SSSTF = Staging, Storage, Sizing, and Treatment Facility
TAN = Test Area North
OSHA = Occupational Safety and Health Act

2.7 Idaho National Engineering and Environmental Laboratory Requirements and Documents

The following list contains INEEL requirements and documents that are applicable to the remedial design:

- *Architectural Engineering Standards* (DOE-ID 2002c)
- *INEEL Storm Water Pollution Prevention Plan for Construction Activities – Generic Plan* (DOE-ID 1998)
- TAN V-Tank Isolation and Line Flushing (ECF-6678)
- EAR-17, "Hazardous Substance/Waste Spill Control"
- Management Control Procedure (MCP) -7, "Radiological Work Permit"
- MCP-70, "Waste Generator Services—Mixed Low-Level Waste Management"
- MCP-124, "Response to Abnormal Radiological Situations"
- MCP-187, "Posting Radiological Control Areas"
- MCP-233, "Process for Developing, Releasing, and Distributing ER Documents (Supplemental to MCP-135 & MCP-9395"
- MCP-425, "Radiological Release Surveys and the Control and Movement of Contaminated Materials"
- MCP-540, "Documenting the Safety Category of Structures, Systems, and Components"
- MCP-557, "Managing Records"
- MCP-1194, "Logbook Practices for ER and D&D&D Projects"
- Program Requirements Document (PRD) -5117, "Accident Prevention Signs, Tags, and Barriers"
- MCP-2742, "Temporary Facilities"
- MCP-2811, "Design Control"
- MCP-3449, "Safety and Health Inspections"
- MCP-3472, "Identification and Characterization of Environmentally Regulated Waste"
- MCP-3475, "Temporary Storage of CERCLA-Generated Waste at the INEEL"
- MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment"
- MCP-9110, "Suspect Counterfeit Item Identification and Control"

- MCP-9439, "Preparation for Environmental Sampling Activities at the INEEL"
- NFPA 70, "National Electric Code,"
- NFPA standards
- PDD-600, "INEEL Maintenance Management Program"
- PDD-1003, "Waste Generator Services Program"
- Plan (PLN) -114, "INEEL Emergency Plan/RCRA Contingency Plan"
- PLN-120, "Hazardous Material Packaging and Transportation Quality Implementation Plan"
- PRD-183, "INEEL Radiological Control Manual"
- PRD-1007, "Work Coordination and Hazard Control"
- PRD-2012, "Lockouts and Tagouts"
- PRD-2014, "Excavations and Surface Penetrations"
- PRD-5006, "Subcontractor/Supplier Quality Plan"
- PRD-5030, "Environmental Requirements for Facilities, Processes, Materials, and Equipment"
- STD-101, "Integrated Work Control Process"
- *Subcontractor Requirements Manual*
- TAN-99-008, "NEPA Approval Form and Environmental Checklist Test Area North Waste Area Group 1 Operable Unit 1-10 Remedial Action"
- Template (TEM) -104, "Model for Preparation of Characterization Plan"
- Technical Procedure (TPR) -80, "Radioanalytical Data Validation"
- *Safety Analysis Report for Test Area North Operations* (Walker 2002).

3. UNCERTAINTY MANAGEMENT

This section describes the project's approach for managing uncertainties that could arise during the course of the remedial design and ERA for the V-Tanks. Unforeseen events could arise throughout the course of the project, as with any remedial action. Section 3 of the original Remedial Design/Remedial Action Work Plan (DOE-ID 2002b) covers uncertainty management for the overall V-Tank remediation.

An objective of the remedial action is to minimize unforeseen events. As part of the remedial design, several possible events have been analyzed and an approach developed for each to manage the uncertainty. The project uncertainties that have been analyzed are as follows:

- Encountering unexpected/undetected underground utilities (e.g., pipes)
- Ability to fully characterize the AOC
- Schedule contingencies.

Additional project uncertainties are addressed in Section 4.1, "Design Assumptions for the Early Remedial Action."

3.1 Encountering Unexpected/Detected Underground Utilities

Subsurface surveys and review of as-built drawings and interviews with facility personnel will be used to ensure that the underground utilities are identified.

3.2 Ability to Fully Characterize the Area of Contamination by Drilling

A three-phased approach is planned for sampling activities to determine sampling locations. Additional sampling locations will be added, as needed, based on data from the first phases of sampling.

3.3 Schedule Contingencies

Currently, the ERA is scheduled to occur in 2003. To support the planned start of ERA activities, it might be beneficial to begin certain site-preparation activities before the Remedial Design/Remedial Action Work Plan Addendum becomes final. The Agencies agree that site preparation and characterization activities (i.e., pipe inspections and radiation surveys) may begin before review of the draft final Remedial Design/Remedial Action Work Plan Addendum. All ERA site-preparation activities and equipment ultimately must meet requirements in the final Remedial Design/Remedial Action Work Plan Addendum. If procurement of selected equipment is necessary before the submittal or comment resolution on the draft Remedial Design/Remedial Action Work Plan Addendum, then the equipment requirements may be provided to the Agencies for review earlier than the entire draft Remedial Design/Remedial Action Work Plan Addendum.

Adverse weather could affect field activities; this has been addressed by scheduling the fieldwork during the summer months. Schedule impacts during the summer due to adverse weather are expected to be minor.

4. REMEDIAL DESIGN

This section in the remedial design is presented in terms of the design assumptions, design criteria, technical elements, and quality assurance. These design criteria and elements do not apply to the VCO activities.

4.1 Design Assumptions for the Early Remedial Action

The following general assumptions, related to Tank V-9 isolation and sand filter relocation, are limiting factors and conditions under which the remedial design for the ERA of Group 2 sites was developed:

- The soil to be remediated in FY 2006 as part of the V-Tank remediation will be defined and fully characterized for disposal during the ERA sampling activities
- No criticality issues are associated with the ERA described in this Remedial Design/Remedial Action Work Plan Addendum
- The ICDF waste acceptance criteria can be met by all waste designated for on-Site disposal
- Disposal facilities will be available for all waste streams not going to the ICDF
- The ICDF will be open in time to receive the waste.

4.1.1 Tank Isolation and Sand Filter Relocation Assumptions

The following assumptions apply to the tank isolation and sand filter relocation activities:

- No groundwater will be encountered during the ERA.
- The tank locations, orientations, and dimensions are as documented in configuration-controlled as-built INEEL drawings.
- Piping and utilities are as documented in configuration-controlled as-built INEEL drawings.
- The VCO piping in the CERCLA area of contamination will be removed as part of a concurrent operation. Waste from the VCO activities will be segregated from CERCLA waste.
- Piping to be removed is stainless steel, and structural integrity is intact.
- Radiological levels might require remote operations.
- Debris may be shipped to the Staging, Storing, Sizing, and Treatment Facility (SSSTF) or other facility for treatment (microencapsulation), if necessary. The SSSTF (if used) subsequently will dispose of the treated debris to the ICDF.
- No soil will be removed as part of the pipe removals. Soil will be returned to the excavation.

4.2 Design Criteria

The design criteria provide the framework and basis for the technical design elements necessary to achieve the remedial action. The sizing and design of the technical elements are controlled by the design criteria. The design criteria associated with sand filter relocation and tank isolation are discussed below:

- **Personnel Dose Limitations.** The dose rate goal for general work areas outside high-radiation zones is less than 5 mR/hr. A radiological engineer will establish personnel and project ALARA goals for work in areas in excess of 5 mR/hr.

- **Waste Packaging.** The U.S. Department of Transportation requirements—specified in 49 *Code of Federal Regulations* (CFR) 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements"—will be met for any waste to be shipped to the ICDF or off-Site.

4.3 Technical Elements

The design's technical elements are the physical components required to be in place and functional during the remedial action.

4.3.1 V-9 Tank Isolation and Sand Filter Relocation

This design will allow the effluent piping between TAN-616 and Tank V-9 to be inspected and flushed (if necessary). The design also will allow for the line between Tank V-9 and TAN-616 to be isolated. In addition, the design will allow the piping between the valve pit (TAN-1704) and Tank V-9 to be isolated. After isolation and capping are complete, all trenches will be backfilled for safety.

The sand filter, located aboveground between Tanks V-9 and TAN-161, will be relocated and disposed of at a later date as part of the V-Tank remedial action. The sand filter has been isolated already. It does not have any piping connections that penetrate the ground surface. Implementation of the remedial action tasks for Tank V-9 inspection, isolation, and sand filter relocation is discussed in Section 6.2, "Remedial Action Work Tasks," and shown in Figures 6-1 and 6-2.

4.3.2 Area of Contamination Sampling

Sampling activities are described in Section 6.2.3, "Remediation Activities," and are presented in detail in the Field Sampling Plan (DOE-ID 2003c).

4.4 Quality Assurance

A safety category evaluation (included as Appendix A) has been prepared for all ERA structures, systems, components, and activities. (The ERA activities do not include any modification to the safety-significant V-Tanks.) The evaluation was performed in accordance with MCP-540, "Documenting the Safety Category of Structures, Systems, and Components." A consumer-grade designation (equivalent to Quality Level 4) has been deemed appropriate for this ERA effort, based on having no ERA safety-basis components or activities. Since the V-Tanks currently are designated as a nuclear facility, the Price-Anderson Amendment Act requirements apply to this early remediation.

Sampling performed as part of the Group 2 ERA will comply with the quality assurance/quality control criteria and requirements detailed in the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites* (DOE-ID 2002d) for sampling and data management. Quality

control requirements for field sampling also are discussed in the Field Sampling Plan (DOE-ID 2003c). Packaging and transportation will be performed in accordance with PLN-120, "Hazardous Material Packaging and Transportation Quality Implementation Plan."

5. ENVIRONMENT, SAFETY, AND HEALTH

This section provides an overview of the approach for ensuring environmental compliance through the environmental checklist and worker safety and health through the HASP and STD-101, "Integrated Work Control Process." It also addresses how ALARA radiation exposure goals will be developed and met through the quality-level evaluation and radiation control measures. Compliance with environmental regulations was addressed in Section 2 of this document.

Safe work documents (such as radiation work permits, job safety analyses, and a Hazards Profile Screening Checklist) will be developed in accordance with existing INEEL procedures and systems to implement the HASP requirements. They will be modified, supplemented, or generated (as necessary) during work activities to address changing onsite conditions or revisions to work methods described in the planning documents.

Currently, the V-Tanks fall under a TAN Facility Safety Analysis Report/Technical Safety Requirement (SAR/TSR) document. A revision to the SAR/TSR document will be prepared and issued to revise a current TSR requirement to allow flushing of liquid into the tanks. A hold point will be included in INEEL work control documents to ensure that this SAR/TSR document revision is issued before flushing the piping into the V-Tanks (if flushing is determined to be necessary).

6. REMEDIAL ACTION WORK PLAN

This section details the approach to implementing the remedial design and the steps and schedule for conducting the remedial action. The following subsections detail the technical requirements.

6.1 Project Controls

Project controls include field oversight and construction management, access control, protocol and coordinating field oversight, project cost estimate, and the project schedule.

6.1.1 Field Oversight and Construction Management

The DOE-ID remediation project manager will be responsible for notifying the EPA and Idaho Department of Environmental Quality of project activities such as project startup, closeout, and inspections. The DOE-ID remediation project manager also will serve as the single interface point for all routine contact amongst the Agencies, the WAG 1 project manager, and the INEEL management and operations contractor. The Agencies will not conduct a prefinal inspection to initiate the ERA. A prefinal inspection will accompany the final remedial action.

The INEEL management and operations contractor will provide field oversight and construction management services for this project. The INEEL management and operations contractor also will provide field support services for health and safety, radiological control, environmental compliance, quality assurance, and landlord services. An organization chart and position description are provided in the *Health and Safety Plan for the TSF-09/18 and TSF-21 Early Remedial Action Field Sampling, Equipment Removal and Disposal at Test Area North, Waste Area Group 1, Operable Unit 1-10* (INEEL 2003b).

Visitors to the site who wish to observe activities must meet badging and training requirements necessary to enter INEEL facilities. Training requirements for visitors are described in Section 4 of the project HASP (INEEL 2003b). The INEEL management and operations contractor also will direct the subcontractors performing work onsite.

6.1.2 Project Cost Estimate

The cost estimates for the V-Tanks remedial action addressed by this work plan are presented in Appendix B, "Early Remedial Action Cost Estimate."

6.1.3 Project Schedule and Deliverables

Table 6-1 presents the V-Tanks ERA working schedule and deliverables summary with associated milestones.

6.2 Remedial Action Work Tasks

Implementing the remedial design will include a sequence of tasks to perform Tank V-9 isolation and sand filter relocation safely and efficiently and further characterize contaminated soil. The work includes properly storing, transporting, and disposing of contaminated materials. This section describes the work and interfaces.

Table 6-1. Working schedule and deliverables for the Operable Unit 1-10 Group 2 early remedial action.

Activity	Planned Start Date	Planned Completion Date	Review Duration in Calendar Days
Early Remedial Action Remedial Design			
Explanation of Significant Differences issued as final	—	4/22/03	—
Submittal of draft Remedial Design/Remedial Action Work Plan Addendum to Agencies	—	3/11/03	—
Agency review of draft Remedial Design/Remedial Action Work Plan Addendum	3/11/03	3/26/03	15
Remedial Design/Remedial Action Work Plan Addendum comment resolution (potential tabletop review)	3/27/03	5/19/03	—
Remedial Design/Remedial Action Work Plan Addendum issued as final	—	5/26/03	—
V-Tanks Early Remedial Action	—	—	—
Mobilization to Test Area North for soil characterization	6/16/03	6/19/03	—
Soil characterization sampling[a]	6/23/03	7/3/03	—
Data analysis and management	7/7/03	8/15/03	—
Sand filter relocation and piping isolation	7/14/03	7/31/03	—
V-Tanks Piping Isolation and Soil Sampling Data Compilation Report preparation	8/11/03	9/30/03	—
Submittal of V-Tanks Piping Isolation and Soil Sampling Data Compilation Report to Agencies	—	10/20/03	—
Agency review of V-Tanks Piping Isolation and Soil Sampling Data Compilation Report	10/20/03	11/19/03	30
V-Tanks Piping Isolation and Soil Sampling Data Compilation Report comment resolution/incorporation	11/20/03	12/10/03	—
V-Tanks Piping Isolation and Soil Sampling Data Compilation Report issued as final	—	12/19/03	—

a. Limitation and validation reports will be submitted with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991) required 120 days from start of sampling. This is a required submittal date to the Agencies, but is not "enforceable" milestone under the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991).

6.2.1 Access Control

Temporary access-control fencing will be installed to restrict access by wildlife or unauthorized personnel into the work area and to prevent drilling and heavy equipment from driving over the tanks and subsurface structures. Existing fencing around portions of the site may be used to establish the access-control boundary. Contamination-control fencing around contaminated areas will be colored plastic safety fencing or equivalent. Ingress and egress control of contaminated areas will be defined in the HASP (INEEL 2003b).

6.2.2 Premobilization

Before mobilization, as each task is undertaken, all associated documentation to support the work control for that given task will be prepared and approved. These activities ensure operational readiness before mobilization. Job safety analyses (includes job safety analyses to be provided by INEEL

subcontractors), safe work permits, radiological work permits, ALARA reviews, confined space entry permits, operational procedures, and other work control forms will be prepared for each major portion of the ERA. Waste Determination and Disposition Forms and waste material profiles will be prepared. Additional activities include subsurface investigations to identify lines, utilities, and subsurface structures; preparing lift plans; prejob briefings; and equipment procurement. Startup authority will be granted by STD-101 approval. Management self-assessments, readiness assessments, and operational readiness reviews are not required.

6.2.3 Remediation Activities

Remediation activities will include all work necessary to complete the objectives of this Remedial Design/Remedial Action Work Plan Addendum. The primary construction tasks are described in the following subsections.

6.2.3.1 Mobilization. Mobilization will begin with site preparation activities. These activities include establishing radiological control stations, monitoring locations, and control zones. Site preparation will require installing temporary barriers and signs and establishing, registering, and equipping an approved CERCLA waste storage area, as described in the *Waste Management Plan for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites* (INEEL 2003a). Existing site access roadways will be used. No additional road construction is anticipated for the ERA. Mobilization also will include the sequenced delivery of equipment and personnel to the site, as needed, for ERA activities.

6.2.3.2 Isolating V-9 Tank and Sand Filter Relocation. Isolation of Tank V-9 will require the steps described below. Figures 6-1 and 6-2 show the approximate locations of Tank V-9, the TAN-1704 valve pit, and the TAN-616 building. The steps are described in the order they are most likely to be performed.

1. **Line Inspection:** From the valve within the TAN-616 building, inspect the pipe from TAN-616 toward Tank V-9 to determine if there is a need to flush the lines. A camera will be inserted into the line running from Tank V-9 into TAN-616 through an access port inside TAN-616. Inspection will be performed only in the header and not out to the valves and back toward Tank V-9. The inside of the line will be inspected for liquid pooled in the pipes and for the amount and type of either solid or loose contamination. Flushing will be omitted if inspection identifies no need for it. A visual inspection will be performed when each line is cut, despite whether lines are flushed. The lines will be inspected to determine or confirm the percentage of material contaminating the piping. If flushing is deemed necessary, the following actions will be taken.

    a. **Line Flushing:** When line flushing is necessary, cut and cap the line between TAN-616 and Tank V-9, nearer to Tank V-9. At the cut location, a connection will be installed that will allow water to be injected to flush the line toward TAN-616. The flushed material may go to either Tank V-1 or V-2.

2. **Sand Filter Relocation:** The sand filter will be relocated within the current area of contamination pending disposal using existing on-Site equipment. The CERCLA piping may be placed into the sand filter's interior to help fill the void space in the sand filter in order to meet disposal facility criteria. The remaining void space in the sand filter will be grouted at the disposal facility, which also may serve as microencapsulation of the mixed low-level waste debris piping. If the piping is not placed into the sand filter, the sand filter's cavity will still be filled to meet the void space requirements. In either case, the interior of the sand filter will be visually inspected to verify the contents.

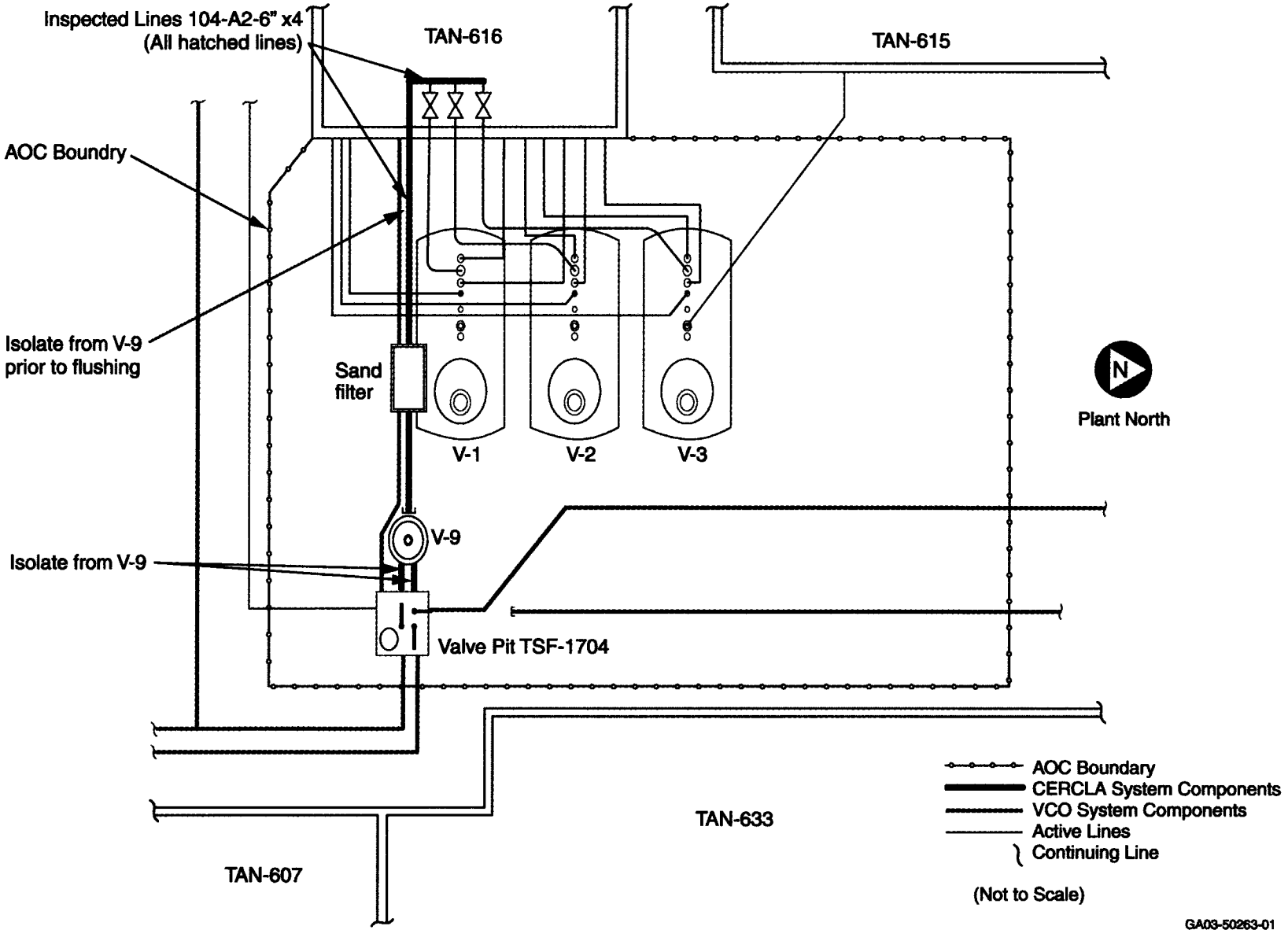

Figure 6-1. The V-Tank line inspection and relocation—plan view.

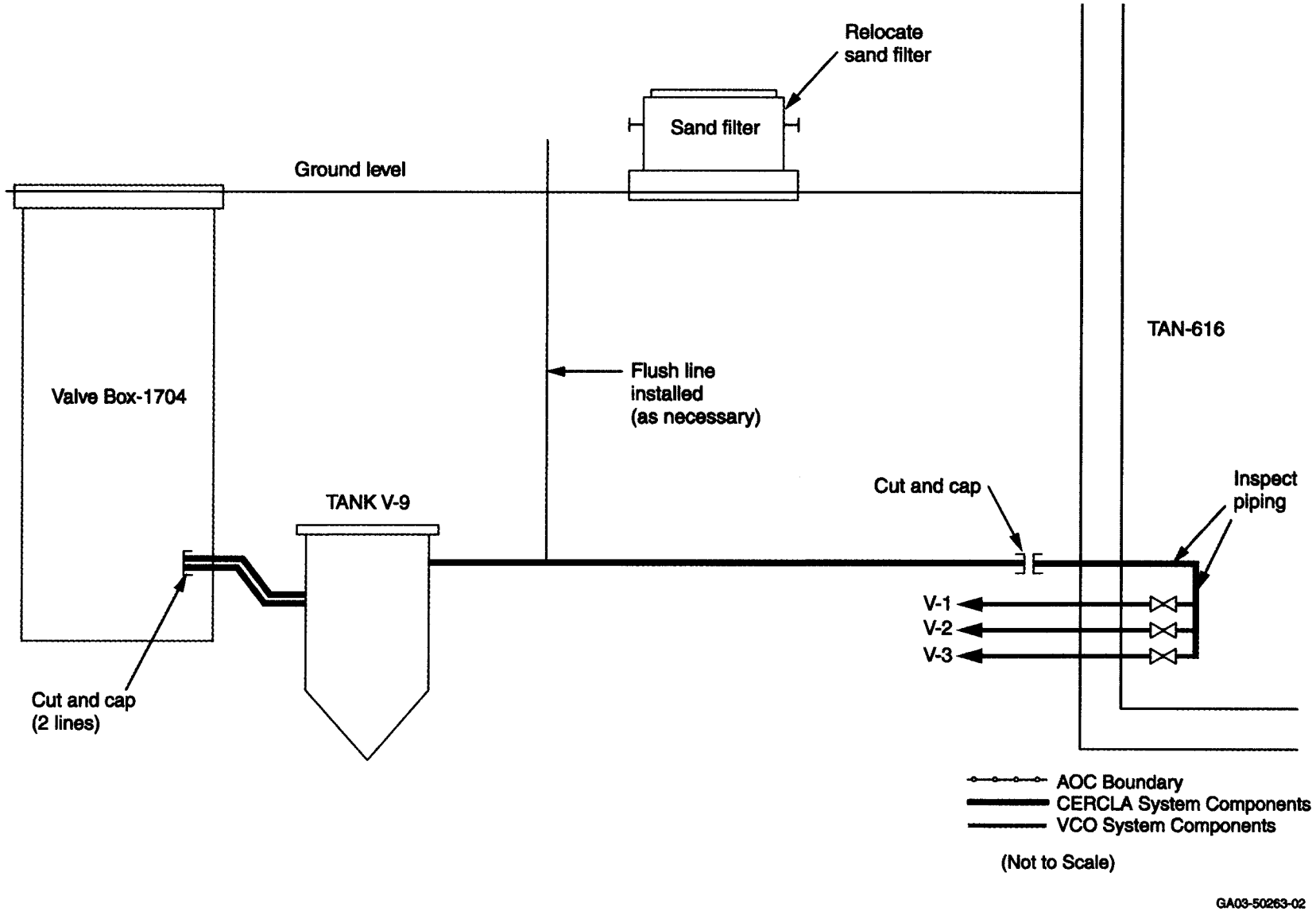

Figure 6-2. The V-Tank line inspection and relocation—cross-sectional view.

3. **V-9 Tank Isolation:** The Tank V-9 isolation includes cutting and capping of the line between TAN-616 and Tank V-9, and cutting and capping the lines between Tank V-9 and the TAN-1704 valve pit. The pipes between the TAN-1704 valve pit, Tank V-9, and TAN-616 will remain in place.

    a. The pipe from Tank V-9 to TAN-616 will be cut, and a permanent cap will be installed in two places—(1) near Tank V-9 and (2) near TAN-616. The exact locations of the cut will depend on ALARA concerns and line accessibility.

6.2.3.3 ***Area of Contamination and Soil Characterization.*** For defining the AOC (AOC; Section I), a two-phased sampling design will be employed. Phase I is a preliminary investigative effort that will be accomplished before subsurface soil-sampling activities and will consist of surface gamma scans to locate surface and shallow subsurface contamination to direct subsequent sampling during Phase II.

Phase II will consist of shallow and deep subsurface soil sampling to determine the nature and extent of contamination related to the V-Tanks. Phase II also will provide data for a hazardous waste determination and waste profile for the soil near the V-Tanks. One boring will be located adjacent to the cask storage pad to address potential surface run-off from the pad. One sample from inside the fence will be analyzed for pesticides/herbicides to address the possible use of these chemicals for weed control, as discussed in the Track 2 Summary Report (ITC 1994). These data may be used in FY 2004 to estimate contaminated soil volumes for subsequent RCRA closure activities in FY 2004.

6.2.3.4 Decontamination. Personnel decontamination will be done according to the requirements in the HASP (INEEL 2003b). Decontamination of drilling equipment is expected for equipment release and for data quality between sampling locations. After the piping has been removed, debris will be packaged for treatment as debris (if necessary) and shipped to the SSSTF for treatment and subsequent disposal to the ICDF.

6.2.3.5 Demobilization. Demobilization will occur after field activities. Support facilities, such as office and storage areas, will be emptied. Control fences and signage will be established in accordance with the requirements of the *Institutional Control Plan for the Test Area North, Waste Area Group 1* (INEEL 2000).

6.3 Waste Management and Transportation

Waste generated from the remedial actions planned at TAN under the ROD (DOE-ID 1999) and this Group 2 Remedial Design/Remedial Action Work Plan Addendum will be dispositioned as identified in the Waste Management Plan (INEEL 2003a), which is a supporting document to this Group 2 Remedial Design/Remedial Action Work Plan Addendum. These waste streams will be managed in approved CERCLA waste storage areas until ultimate disposition in accordance with the Waste Management Plan (INEEL 2003a). Under this plan, waste will be treated (if necessary) and disposed of at an acceptable facility. Acceptability of the treatment or disposal facility is dependent on characterizing and classifying waste in the Waste Management Plan and complying with a treatment or disposal facility's waste acceptance criteria. Facilities must be (1) a permitted treatment or disposal facility with CERCLA off-Site authority, (2) an INEEL disposal facility expressly designated to accept CERCLA waste (e.g., the ICDF), (3) a site with disposal authorization from DOE Headquarters (e.g., the Radioactive Waste Management Complex), or (4) an industrial landfill (e.g., Central Facilities Area Landfill).

The sand filter will be characterized using the analytical data obtained from the contents of the sand filter. All piping and debris will be treated by macroencapsulation. Refer to the Waste Management Plan (INEEL 2003a) for a characterization description for ICDF inventory purposes.

Table 6-2 provides a summary of the handling and packaging requirements for each anticipated waste stream. Estimated volumes, waste classifications for near-surface disposal, U.S. Department of Transportation waste-shipping classifications and packaging requirements, and planned disposal facilities are included in Table 6-2. The information in Table 6-2 is based on currently available sampling data associated with the V-Tanks and the waste characterization strategy detailed in the Waste Management Plan (INEEL 2003a).

6.4 Inspections

No prefinal or final inspection will be performed specifically for the ERA activities. The completed ERA activities will be documented in a brief field report and will be included in the Remedial Action Report for OU 1-10 Group 2. The field report may include the following:

- Identifying work defined in this Group 2 Remedial Design/Remedial Action Work Plan Addendum and certifying that the work was performed
- Listing problems encountered during the V-Tanks' ERA and resolutions to these problems
- Showing as-built drawings with final contours and piping, as applicable.

The V-Tanks ERA field report may be incorporated into the OU 1-10 Remedial Action Report, which is a primary document that will be submitted after completion of the OU 1-10 Group 2 remedial action and inspection. Requirements for the OU 1-10 Remedial Action Report will be addressed in a future OU 1-10 Group 2 Remedial Design/Remedial Action Work Plan.

6.5 Supporting Documents

The following sections provide a brief description of documents associated with the V-Tanks' remedial action activities, which are addressed in this addendum. Three documents specifically support the ERA: (1) the Field Sampling Plan (DOE-ID 2003c), (2) the Health and Safety Plan (INEEL 2003b), and (3) the Waste Management Plan (INEEL 2003a). Other, broader documents are cited for completeness.

Table 6-2. Proposed waste handling and packaging for remediation waste.

Remedial Action Activity	Waste Description	Location	Expected Type (MLLW, LLW, TSCA) and Applicable Waste Codes	Estimated Volume	Planned U.S. Department of Transportation Class Packaging	Storage Location	Planned Treatment/Disposal
Isolation of Tank V-9	Empty piping	Tank V-9 effluent piping	MLLW (F001)	15 ft^3	Class 7 LSA Package in sand filter or wooden waste box.	CERCLA WSA	Macro or microencapsulate/ICDF[a]
Isolation of Tank V-9	Empty NaOH piping	—	MLLW (F001, D007)	15 ft^3	Class 7 LSA Package in sand filter or wooden waste box.	CERCLA WSA	Macro or microencapsulate/ICDF[a]
Sand filter relocation	Sand filter structure and contents	Tank V-9 proximity	MLLW (F001) TSCA PCB remediation waste >50 ppm	22.7 ft^3	Class 7 LSA Shrink-wrap or containerize in a wooden waste box.	CERCLA WSA	Macro or microencapsulate/ICDF[a]
Preparation for Tank V-9 isolation	Concrete tank cradles and other miscellaneous debris	V-Tank AOC	MLLW (F001)	96 ft^3	Class 7 LSA Metal drums or box or wooden waste box	CERCLA WSA	Macro or microencapsulate/ICDF[a]
Isolation of Tank V-9, debris removal, and sand filter relocation	Secondary waste debris (personal protective equipment, rags, tools, etc.)	V-Tank AOC	MLLW (F001)	70 ft^3	Class 7 LSA Metal drums or box or wooden waste box	CERCLA WSA	Macro or microencapsulate/ICDF[a]
Soil sampling to further define the AOC and characterize soil	Secondary waste debris (personal protective equipment, rags, tools, and lexan liners)	V-Tank AOC	MLLW (F001)	70 ft^3	Class 7 LSA Metal drums or box or wooden waste box	CERCLA WSA	Macro or microencapsulate/ICDF[a]
Soil sampling to further define the AOC and characterize soil	Decontaminated water	V-Tank AOC	MLLW (F001)	300 gal	Class 7 LSA Metal drums	CERCLA WSA	Absorb or solidify free liquid/ICDF[a]

Table 6-2. (continued).

Remedial Action Activity	Waste Description	Location	Expected Type (MLLW, LLW, TSCA) and Applicable Waste Codes	Estimated Volume	Planned U.S. Department of Transportation Class Packaging	Storage Location	Planned Treatment/Disposal
Soil sampling to further define the AOC and characterize soil	Unaltered soil sample returns	V-Tank AOC	MLLW (F001)	NA	NA	NA	Expected to meet alternative soil treatment standards. Will be disposed of at the Analytical Laboratory or will be returned to AOC.
Soil sampling to further define the AOC and characterize soil	Altered soil sample residues	V-Tank AOC	MLLW (F001)	NA	NA	NA	Will be treated, if necessary, and disposed of by the Analytical Laboratory.
Administrative activities	Administrative paper waste	V-Tank AOC	NA	NA	NA	NA	Central Facilities Area Landfill

a. The ICDF is the planned facility for disposal. If, however, the waste cannot meet the waste acceptance criteria, it may be disposed of at another facility (such as Envirocare).
AOC = area of contamination
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
ICDF = INEEL CERCLA Disposal Facility
LLW = low-level waste
MLLW = mixed low-level waste
NA = not applicable
PCB = polychlorinated biphenyl
TSCA = Toxic Substances Control Act
WSA = waste storage area

6.5.1 Early Remedial Action Field Sampling Plan

The Field Sampling Plan (DOE-ID 2003c) specifies data needs, sampling objectives, sampling locations and frequencies, procedures, and the controls necessary to characterize the AOC soil to determine if it meets the ICDF's waste acceptance criteria and to define the AOC. The Field Sampling Plan is developed using the established *Guidance for the Data Quality Objectives Process* (EPA 1994).

The Field Sampling Plan also addresses sampling requirements for secondary waste generated throughout the early remediation activities. Although the intent is to use process and historical data to characterize secondary waste for disposal, field surveys and physical sampling and analysis might be required in some instances.

6.5.2 Health and Safety Plan

The INEEL has prepared a site-specific HASP (INEEL 2003b) to provide safety guidance applicable to INEEL personnel. The HASP provides oversight, construction management support, and sampling activities for the ERA portion of the remediation project. The *Health and Safety Plan for the Decontamination and Dismantlement of the Liquid Waste Treatment Plant (TAN-616)* (INEEL 2002) will be used for pipe removal and V-Tank isolation. These HASPs are working documents, which are reviewed and modified accordingly as the project planning documents are developed and finalized, and they cover the following safe-working areas of concern:

- Task-site responsibility
- Personnel training
- Occupational Medical Program and medical surveillance
- Safe work practices
- Site control and security
- Hazard evaluation
- Personal protective equipment
- Personnel decontamination and radiation control
- Emergency response for the project sites.

Safe work documents, such as radiological work permits and job safety analyses, will be developed in accordance with existing INEEL procedures and systems to implement the HASPs' requirements. They will be modified, supplemented, or generated (as necessary) during the work activities to address changing conditions onsite or revisions to the work methods described in the planning documents.

6.5.3 Waste Management Plan

A Waste Management Plan (INEEL 2003a) has been prepared as a supporting document to this Group 2 Remedial Design/Remedial Action Work Plan Addendum. The Waste Management Plan describes the waste to be generated, waste minimization, waste characterization strategy, on-Site management and disposition, and off-Site disposition. Existing waste streams generated from previous

V-Tank activities, which are currently stored at the INEEL, and newly generated waste streams not generated by the ERA activities are addressed in the Waste Management Plan prepared and approved in 2001 (INEEL 2001c). Ultimate disposition of the generated or existing waste streams for the V-Tanks is based on characterization of each waste stream and the waste acceptance criteria for approved treatment and disposal facilities.

6.5.4 Operations and Maintenance Plan

The V-Tank ERA will not affect operations and maintenance at TAN. The *Operations and Maintenance Plan for Test Area North, Operable Unit 1-10* (DOE-ID 2001) covers requirements for ongoing maintenance and inspection and environmental monitoring for OU 1-10 sites after remedial action completion. The plan also cites and interfaces with activities covered in the Institutional Control Plan (INEEL 2000) and further addresses requirements for 5-year reviews. The Operations and Maintenance Plan may be revised, as necessary, to incorporate changes and additions identified during implementation.

6.5.5 Institutional Control Plan

The V-Tank ERA will not affect the implementation of institutional controls in accordance with the Institutional Control Plan (INEEL 2000). The plan provides institutional control requirements for all WAG 1 sites requiring controls and inspection items for annual inspections. The Institutional Control Plan may be revised, as necessary, to incorporate changes and additions identified during implementation and subsequent 5-year reviews.

6.5.6 Spill Prevention and Response Program

A separate Spill Prevention and Response Plan is not necessary to implement the ERA. Any inadvertent spill or release of potentially hazardous materials will be addressed in EAR-17, "Criticality Concerns Associated with the TAN V-Tanks." In the event of a spill, the emergency response plan contained in EAR-17 will be activated. All materials and substances on the work site will be stored and handled in accordance with the applicable regulations and will be stored in approved containers.

7. CHANGES TO REMEDIAL DESIGN/REMEDIAL ACTION SCOPE OF WORK AND GROUP 2 REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN

The Scope of Work (DOE-ID 2000) describes the preparation of two Remedial Design/Remedial Action Work Plans for OU 1-10—one for the Group 1 sites and the other for the Group 2 sites. The OU 1-10 Remedial Design/Remedial Action Work Plan for Group 1 sites has been approved through the Federal Facility Agreement and Consent Order process by Agency managers in accordance with the schedule in the Scope of Work (DOE-ID 2000). For several reasons, Agency managers agreed that remedial design and subsequent remedial action should progress quickly for the V-Tanks. To implement this process, the Agencies agreed that the Group 2 Remedial Design/Remedial Action Work Plan only address the V-Tanks. It was agreed that these remaining sites would be known as the Group 3 sites. The Group 3 Remedial Design/Remedial Action Work Plan and schedule are discussed in the original Group 2 Remedial Design/Remedial Action Work Plan (DOE-ID 2002b).

This Remedial Design/Remedial Action Work Plan Addendum was established as a secondary document with a 30-day Agency review in the Technology Evaluation Scope of Work (DOE-ID 2002a). This Remedial Design/Remedial Action Work Plan Addendum implements the ERA concept described in the Technology Evaluation Scope of Work (DOE-ID 2002a)

The technology evaluation conducted under the *Technology Evaluation Report for the V-Tanks, TSF-09/18, at Waste Area Group 1, Operable Unit 1-10* (DOE-ID 2003d) resulted in the identification of a new preferred alternative for V-Tanks' contents, treatment, and disposal. The new V-Tanks' remedy for content removal and treatment will be presented in a new proposed plan and selected in a ROD amendment. A new V-Tanks Remedial Design/Remedial Action Scope of Work and a new V-Tanks Remedial Design/Remedial Action Work Plan will be prepared after the ROD amendment has been issued.

8. INSTITUTIONAL CONTROLS, OPERATIONS AND MAINTENANCE, AND FIVE-YEAR REVIEW

The original Group 2 Remedial Design/Remedial Action Work Plan provides information on institutional controls, operation and maintenance, and 5-year reviews. The ERA is only a portion of the V-Tank remedial action activities and does not affect previous planning for institutional controls, operation and maintenance, and 5-year reviews.

9. REFERENCES

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Appendix A

Safety Category Designation and Record

Appendix A

Safety Category Designation and Record

414.02
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Rev. 04

SAFETY CATEGORY DESIGNATION AND RECORD

Safety Category Evaluation Performed By: Miyasaki, Dean/Wendt, Kraig M. Date: January 28, 2003

Facility/Structure/System/Component: TAN-616 V-tank/Piping Isolation and Soil Sampling Early Remedial Action Hazard Category: 2

IDENTIFICATION OF ITEM	SAFETY CATEGORY DESIGNATION	TECHNICAL JUSTIFICATION
All equipment and components purchased and/or fabricated for performing the early remedial actions (ERA) for TAN-616 V-tank/piping isolation.	Consumer Grade (CG)	The safety basis addresses hazards and potential accidents of the operations at TAN. No "safety significant" structures, systems, and components are noted for the TAN-616 V-tanks and associated piping. There is one safety requirement that specifies no movement or addition of the material in the V-tanks, but is currently in the process of being revised to allow transfer of the contents of the V-tank system. Therefore the equipment and components for the early remedial actions for TAN-616 V-tank/piping isolation is consumer grade. After the TSR is revised, isolation may begin.
All equipment and components purchased and/or fabricated for performing the early remedial actions (ERA) for TSF-06, TSF-26 and V-Tanks Soil Sampling	Consumer Grade (CG)	The safety basis addresses hazards and potential accidents of the operations at TAN. No safety requirement or "safety significant" structures, systems, and components are noted for ERA soil sampling at TAN. Therefore the equipment and components for the early remedial actions for soil sampling at TAN is consumer grade.

Note: Identify and record safety category in accordance with MCP-540, and obtain appropriate approvals. Completed and approved form becomes a part of the safety basis documentation.

A. G. Ramos	A. G. Ramos	1/28/03
Safety Analysis Lead/Supervisor Concurrence Printed/Typed Name	Safety Analysis Lead/Supervisor Concurrence Signature	Date
K. E. Streeper/J. J. Jessmore 1-30-03	1/28/03 1/30/03	
Facility/Program/Project Approval Printed/Typed Name	Facility/Program/Project Approval Signature	Date

Appendix B

Remedial Action Cost Estimate

Appendix B

Remedial Action Cost Estimate

The cost estimate for the Waste Area Group (WAG) 1 Operable Unit (OU) 1-10 Group 2 Sites Early Remedial Action Remedial Design/Remedial Action Work Plan is presented in Table B-1. The estimated costs are provided at a summary level, and only the costs associated with the remedial design and remedial action for the V-Tanks early remedial actions associated with the Technical Support Facility (TSF) -09 and TSF-18 sites are included.

The costs in Table B-1 include both direct and indirect costs. Direct costs are estimated for labor, equipment, construction, and operation activities to design and implement the selected remedy for the V-Tanks' early remedial actions. Indirect costs are estimated for activities to support the remedial design and remedial action activities (such as project management, construction management, and project support). Although the estimated costs are projected to be within +15% and –10%, the estimated costs are based on specific assumptions related to the identified scope of work. These assumptions are identified in Section B-2.

The estimate for the V-Tanks' remedial design and remedial action is based on specific scope and planned activities. Actual costs through September 2003 have been included in the estimate. The general scope description and general assumptions are provided in Section B-1. Detailed cost estimates and associated assumptions for WAG 1 can be found in the *FY 2003 Detailed Work Plan* (INEEL 2002a). Cost estimates contained in the Detailed Work Plan (DWP) are more detailed, based on the more-detailed scope, assumptions, and schedule activities described in the DWP.

The V-Tank early remedial action will not affect operations and maintenance at Test Area North (TAN). The general scope and assumptions for operations and maintenance are provided in Section B-3.

B-1 GENERAL DESCRIPTION OF V-TANKS' EARLY REMEDIAL ACTIONS

The following sections describe the scope elements for the V-Tanks' early remedial actions. The overall scope is subdivided into the following elements:

- Remedial action management and oversight
- Remedial action preparations
- Isolating Tank V-9 and relocating the sand filter
- Sampling soil to further characterize the V-Tanks' area of contamination.

B-1.1 Remedial Action Management and Oversight

Remedial action management and oversight include project management and support required for planning, executing, and monitoring the remedial design and remedial action activities.

Table B-1. Summary level cost estimate for Operable Unit 1-10 Group 2 V-Tanks' early remedial action.

Activity			Subtotals	Totals
Remedial Design/Remedial Action Work Plan			—	$70,000
Remedial Design/Remedial Action Work Plan			$70,000	—
Remedial action	V-9 tank isolation and sand filter relocation		—	$278,200
		Remedial action preparations[a]	$80,000	—
		Remote line inspection	$36,800	—
		V-9 tank isolation and sand filter relocation	$133,600	—
		Site restoration/waste management	$27,800	—
	Area of contamination soil sampling		—	$359,600
		Remedial action preparations[b]	$28,000	—
		Surface radiation surveys	$20,600	—
		Subsurface investigations	$17,400	—
		Area of contamination drilling and sampling	$171,200	—
		Sample analysis, validation, and data management	$101,800	—
		Site restoration/waste management	$20,600	—
	Early remedial action summary reporting		$10,000	$10,000
Management oversight			—	$56,000
Total Estimated Cost for V-Tanks Early Remedial Action			—	$773,800

a. Includes work planning, site preparations, and readiness evaluation. Work planning for sand filter relocation and piping removal will be coordinated with Voluntary Consent Order removal activities.

b. Includes revisions to work planning, mobilization, site preparations, and readiness evaluation. Work planning for area of contamination characterization will be performed primarily by Waste Area Group 1. The TSF-06 and TSF-26 soil characterization and sampling activity will require minor revision for V-Tank sampling.

B-1.2 Remedial Action Preparations

Early remedial action preparations include all activities that must be completed before the actual remedial action is started. Premobilization documentation will be submitted and personnel training will be completed. Materials and equipment will be procured and delivered to the site. Work control documentation will be prepared for site preparation activities. Site access and administrative controls will be installed.

A project and facility readiness evaluation will be performed to ensure that all requirements have been met, documentation is in place, personnel are properly trained, and equipment is operational.

B-1.3 Isolating Tank V-9 and Relocating the Sand Filter

A sequential approach will be taken to isolate the V-9 tank and relocate the sand filter in a safe and efficient manner. The following steps outline the planned approach:

1. Inspecting piping remotely
2. Relocating the sand filter
3. Excavating area (as necessary to access pipes)
4. Isolating piping from Tank V-9
5. Flushing piping (if necessary)
6. Isolating piping to Tank V-9
7. Removing Voluntary Consent Order piping (Voluntary Consent Order place holder, not performed under this work plan)
8. Removing TAN-1704 valve pit packaging and disposing of related waste (Voluntary Consent Order place holder, Voluntary Consent Order work not performed under this work plan)
9. Characterizing removed material for waste disposal
10. Loading and transporting waste to the INEEL CERCLA Disposal Facility (ICDF) or other appropriate facility for disposal
11. Backfilling excavation.

B-1.4 Sampling Soil to Further Characterize V-Tanks' Area of Contamination

A sequential approach will be taken to characterize the horizontal and vertical extent of soil contamination and associated area requiring Fiscal Year (FY) 2006 remediation in the area surrounding TSF-09 and TSF-18. No contaminated soil will be remediated as part of the early remedial action. The following steps outline the planned approach:

1. Surface large area gross gamma survey

2. Delineation of the area of contamination's surficial boundaries based on survey data, historical events, and site physical boundaries

3. Auger drilling and coring of specified locations within the surficial area of contamination boundary

4. Gamma log test holes for vertical characterization of the area of contamination

5. Subsample test hole cores for analytical analysis (radionuclides and hazardous constituents)

6. Compile 3-dimensional map of the area to be remediated in FY 2006.

B-2 COST ESTIMATE ASSUMPTIONS

The cost estimate presented in Table B-1 is based on the following assumptions. These assumptions have been divided into the categories of key assumptions, general assumptions, and task-specific assumptions.

B-2.1 Key Assumptions

- Liquid waste, if identified in the V-9 outlet pipeage, will be transferred into either V-Tank 1, 2, or 3 by a manifold and valve assembly located in the basement of TAN-616.

- Surface gamma surveys and interior pipe inspections may be performed before finalization of the Group 2 V-Tanks Remedial Design/Remedial Action Work Plan Addendum to facilitate safe and efficient work planning.

- No contaminated soil will be remediated as part of the early remedial action. All excavated and auger cored soil will be returned to the source area.

- The revision to the *Safety Analysis Report for Test Area North Operations* (INEEL 2002b) allowing conditional introduction of material into the V-Tanks will be finalized before commencement of early remedial action activities.

B-2.2 General Assumptions

The general assumptions are listed below:

- The cost estimate is based on the remedial design approach presented in this Group 2 Remedial Design/Remedial Action Work Plan Addendum.

- This Group 2 Remedial Design/Remedial Action Work Plan Addendum will become final in May 2003.

- Sufficient funding is available to support the schedule and planned performance of the work.

- Sufficient facility-supplied resources (i.e., Radiological Engineering, Industrial Hygiene, radiological control technician) will be available at TAN to support the V-Tanks' remedial action work.

- Planned coordination between Voluntary Consent Order activities for piping removal will not be adversely affected by deactivation, decontamination, and dismantlement activities for Building TAN-616.

- Voluntary Consent Order Program funding and documentation will be in place to support the removal of the Voluntary Consent Order TAN-1704 valve box and piping concurrent with the removal of Tank V-9.

- Piping removal work has been planned to be performed in nonfreezing weather conditions.

- The Staging, Storage, Sizing, and Treatment Facility (SSSTF) and ICDF will be operational in July 2003 for treatment and disposal of V-Tank waste streams that meet the ICDF's waste acceptance criteria. The Staging and Storage Annex (SSA), associated with the ICDF, is currently open and available for receipt and interim storage of V-Tank waste streams that meet the SSA's waste acceptance criteria.

- The cost for interim storage and final disposal at the SSA and ICDF is covered by the WAG 3 project. There will be no cost to WAG 1 for interim storage and final disposal at the SSA and ICDF.

- Work control measures for all work described in this work package will be implemented through Standard (STD) -101, "Integrated Work Control Process."

- Separate STD-101 work controls will be prepared for V-9 tank isolations and area of contamination sampling activities. Work control for site preparations, line inspections, and surface surveys will be less rigorous than that required for the two remedial action tasks.

- A project and facility readiness evaluation will be required before V-9 tank isolations and area of contamination sampling activities. The startup authority will be the site area director for TAN. An independent U.S. Department of Energy Idaho Operations Office review will not be required.

B-3 OPERATIONS AND MAINTENANCE

The V-Tank early remedial action will not affect operations and maintenance at TAN; thus, no associated costs are reflected in the estimate.

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Appendix C

V-Tanks' Characterization Sampling Data

Appendix C

V-Tanks' Characterization Sampling Data

This appendix presents the historical sampling results for the V-Tank sand filter, ancillary lines equipment, contaminated soil, and the Test Area North (TAN) -1704 valve box.

C1. SAND FILTER SAMPLING

In 1997, the sand filter was sampled to characterize the filter contents (DOE-ID 2000). The sampling results are summarized in Tables C-1 and C-2.

C2. SOIL SAMPLING

Soil sampling was conducted in four separate events: 1983, 1988, 1993 Track 2, and 1998. In 1983, sampling for gamma emitters was conducted as part of a decontamination and decommissioning project (ITC 1994). Sampling locations for the 1983 event are shown in Figure C-1 and are summarized in the following tables:

- Table C-3, Surface soil radionuclide counts
- Table C-4, Gamma-emitter radionuclides results.

In 1988, the U.S. Department of Energy collected surface and subsurface soil from three boreholes as part of an environmental survey (ITC 1994). Samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, and beta/gamma activity. No VOCs or SVOCs were detected. The sample locations are shown in Figure C-2, and results are summarized in Table C-5—beta/gamma activity and total metals results.

The 1993 Track 2 investigation sampled three boreholes near the V-Tanks. The location of the boreholes is shown in Figure C-3, and results are summarized in the following tables:

- Table C-6, summary of analytes detected and results
- Table C-7, VOC results
- Table C-8, SVOC results
- Table C-9, polychlorinated biphenyl (PCB) results
- Table C-10, inorganic results.

In 1998, samples were collected to determine the preliminary waste classification of future excavated soil (DOE-ID 1998). Figure C-4 depicts the sample locations. Results of the sampling effort are summarized in Table C-11.

C3. REFERENCES

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Sand Filter

Sample Results

Table C-1. Sand filter 1997 sample results.

Compound Name	Sample Unit	Q-Flag (uncertainties)
TV9001017A – RAD		
	pCi/g	
ALPHA	16,500	201
Ag-106M	58.2	12.1
Ag-110M	5,210	335
Am-241	10.7	0.715
BETA	373,000	695
Ce-144	-65.6	54.9
Cm-242	0	0.598
Cm-244	0	0.704
Co-58	2	15.2
Co-60	36,200	1,860
Cs-134	-3.19	11.4
Cs-137	109,000	6,980
Eu-152	631	105
Eu-154	113	22.1
Eu-155	-30.5	25.1
Mn-54	-5.04	10.8
Nb-95	29	12.5
Np-237	0	823
Pu-238	42.1	1.3
Pu-239	45.2	1.38
Ru-106	98	101
Sb-125	-19.2	36.2
Sr-90	103,000	504
Te-99	1,290	46.5
Th-228	0	4.44
Th-230	0	8.43
Th-232	0	2.43
U-234	21,900	737
U-235	661	26.5
U-238	90.7	6.03

Table C-1. (continued).

Compound Name	Sample Unit	Q-Flag (uncertainties)
Zn-65	236	28
TV9001017A – SEMIS-8270		
	µg/kg	
1,2,4-Trichlorobenzene	55,000	U
1,2-Dichlorobenzene	55,000	U
1,3-Dichlorobenzene	55,000	U
1,4-Dichlorobenzene	55,000	U
2,4,5-Trichlorophenol	270,000	U
2,4,6-Trichlorophenol	55,000	U
2,4-Dichlorophenol	55,000	U
2,4-Dimethylphenol	64,000	
2,4-Dinitrophenol	270,000	U
2,4-Dinitrotoluene	55,000	U
2,6-Dinitrotoluene	55,000	U
2-Chloronahilhalene	55,000	U
2-Chlorophenol	55,000	U
2-Methylinaphthalene	55,000	U
2-Methylphenol	54,000	J
2-Nitroanline	270,000	U
2-Nitrophenol	55,000	U
3,3-Dichlorobenzldine	55,000	U
3-Nitroanline	270,000	U
4,6-Dinitro-2-methylphenol	270,000	U
4-Bromophenyl phenylether	55,000	U
4-Chloro-3-methylphenol	55,000	U
4-Chloroanline	55,000	U
4-Chlorophenyl phenylether	55,000	U
4-Methylphenol	53,000	U
4-Nitroanline	270,000	U
4-Nitrophenol	270,000	U
Acenaphithene	55,000	U
Anthracene	55,000	U

Table C-1. (continued).

Compound Name	Sample Unit	Q-Flag (uncertainties)
Benzo(a)anthracene	55,000	U
Benzo(a)pyrene	55,000	U
Benzo(b)fluoranthene	55,000	U
TV9001017A – SEMIS-8270 (continued)		
	µg/kg	
Benzo(g,h,f)perylene	55,000	U
Benzo(k)fluoranthene	55,000	U
Benzoic acid	13,000	J
Benzyl alcohol	55,000	U
Bulylbenzylphthaiate	55,000	U
Carbazote	55,000	U
Chrysene	55,000	U
Di-n-bulyiphlhaiate	55,000	U
Di-n-octylphthaiate	55,000	U
Dibenz(a,h)anthracene	55,000	U
Diethylphthaiate	55,000	U
Dimethylphthaiage	55,000	U
Fluoranthene	55,000	U
Fluorene	55,000	U
Hexachlorabenzene	55,000	U
Hexachlorocyclopentadlene	55,000	U
Hexachloroethane	55,000	U
Indeno(1,2,3-cd)cyrens	55,000	U
Isophorone	55,000	U
N-Nitroso-dl-n-propylamine	55,000	U
N-Nitrosodlphenylamine	55,000	U
Naphthalene	55,000	U
Nitrobenzene	55,000	U
Pentachlorophenol	270,000	U
Phenanthrene	55,000	U
Phenol	14,000	J
Pyrene	55,000	U

Table C-1. (continued).

Compound Name	Sample Unit	Q-Flag (uncertainties)
Pyridine	55,000	U
bfs(2-Chloroethoxy)methane	55,000	U
Bfs(2-Chloroethyl)ether	55,000	U
Bfs(2-Chlorolsopropyl)ether	55,000	U
Bfs(2-Ethylberyl)phihaisis	110,000	
TV9001017A – SEMIS – TCLP		
	µg/L	
1,4-Dichlorobenzene	100	U
2,4,5-Trichlorophenol	500	U
2,4,5-Trichlorophenol	100	U
2,4-Dinitrotoluene	100	U
2-Methylphenol	100	U
4-Methylphenol	100	U
Hexachlorobenzene	100	U
Hexachlorobutadlene	100	U
Hexachloroethane	100	U
Nitrobenzene	100	U
Peniachlorophenol	500	U
Pyridine	100	U
TV9001017A – VOCs – TCLP		
	µg/L	
1,1-Dichloroethene	5	U
1.2-Dichloroethane	5	U
1.4-Dichlorobenzene	5	U
2-Butanone	10	U
Benzene	5	U
Carbon tetrachloride	5	U
Chlorophenzene	5	U
Chloroform	5	U
Tetrachloroethene	1	J
Trichloroethene	5	U
Vinyl chloride	5	U

Table C-1. (continued).

Compound Name	Sample Unit	Q-Flag (uncertainties)
TV900101TV – VOCs – 8260		
	µg/kg	
1,1,1-Trichloroethane	14	U
1,1,2,2-Tetrachloroethane	14	U
1,1,2-Trichloroethane	14	U
1,1-Dichloroethane	14	U
1,2-Dichloroethane	14	U
TV900101TV – VOCs – 8260 (continued)		
	µg/kg	
1,2-Dichloropropane	14	U
2-Butanone	14	U
2-Hexanone	14	U
4-Methyl-2-penilanone	14	U
Acetone	14	U
Benzene	14	U
Bromodichloromethane	14	U
Bromoform	14	U
Bromomethane	14	U
Carbon disulfide	14	U
Carbon tetrachloride	14	U
Chlorobenzene	14	U
Chloroethane	14	U
Chloroform	14	U
Chloromethane	14	U
Dibromochloromethane	14	U
Ethylbenzene	14	U
Methylene chloride	14	U
Styrene	14	U
Tetrachloroethane	2	J
Toluene	14	U
Trichloroethene	14	U
Vinyl chloride	14	U

Table C-1. (continued).

Compound Name	Sample Unit	Q-Flag (uncertainties)
Xylene (ortho)	14	U
Xylene (total meta/para)	14	U
Cls-1,2-Dichloroethene	14	U
Cls-1,3-Dichloropropene	14	U
Trans-1,2-Dichloroethane	14	U
Trans-1,3-Dichloropropene	14	U

U = Not detected, detection limit presented
J = Estimated value

Table C-2. Sand filter 1997 data.

Compound Name	Sample Unit	Q-Flag (uncertainties)
TV9001017A – INORG		
	mg/kg	
Arsenic	25	P
Barium	310	P
Cadmium	121	P
Chromium	1,985	P
Lead	1,349	P
Mercury	1,930	DMCV
Selenium	5.36	P
Silver	247	P
TV9001017A – INORG – TCLP		
	µg/L	
Arsenic	19.4	UP
Barium	138.5	P
Cadmium	385.3	P
Chromium	17.7	P
Lead	219.6	P
Mercury	7.33	CV
Selenium	40.2	UP
Silver	4.5	UP
TV9001017A – HERBS – TCLP		
	µg/L	
2,4,5 TP (Silver)	2	U

Table C-2. (continued).

Compound Name	Sample Unit	Q-Flag (uncertainties)
2,4-D	20	U
TV9001017A – PESTS – TCLP		
	µg/L	
Chlordane (technical)	10	U
Endrin	1	U
Heptachlor	0.5	U
Heptachlor epoxide	0.5	U
Methoxychlor	5	U
Toxaphene	50	U
Gamma-BHC (lindane)	0.5	U
TV9001017A – PCBs		
	µg/kg	
Aroclor-1016	27	U
Aroclor-1221	55	U
Aroclor-1232	27	U
Aroclor-1242	27	U
Aroclor-1248	27	U
Aroclor-1254	27	U
Aroclor-1260	93,000	E
TV9001017ADL – PCBs		
	µg/kg	
Aroclor-1016	14,000	U
Aroclor-1221	27,000	U
Aroclor-1232	14,000	U
Aroclor-1242	14,000	U
Aroclor-1248	14,000	U
Aroclor-1254	14,000	U
Aroclor-1260	290,000	—

U = Not detected, detection limit presented.
P = Analysis by inductively coupled plasma atomic-emission spectroscopy.
CV=- Analysis by cold vapor atomic-absorption spectroscopy.
E = Concentration exceeds calibration range.
D = The sample required dilution for analysis due to high levels of mercury.
M = An aliquot for the inductively coupled plasma digestate was analyzed for mercury due to the elevated concentration.

Soil Samples Results

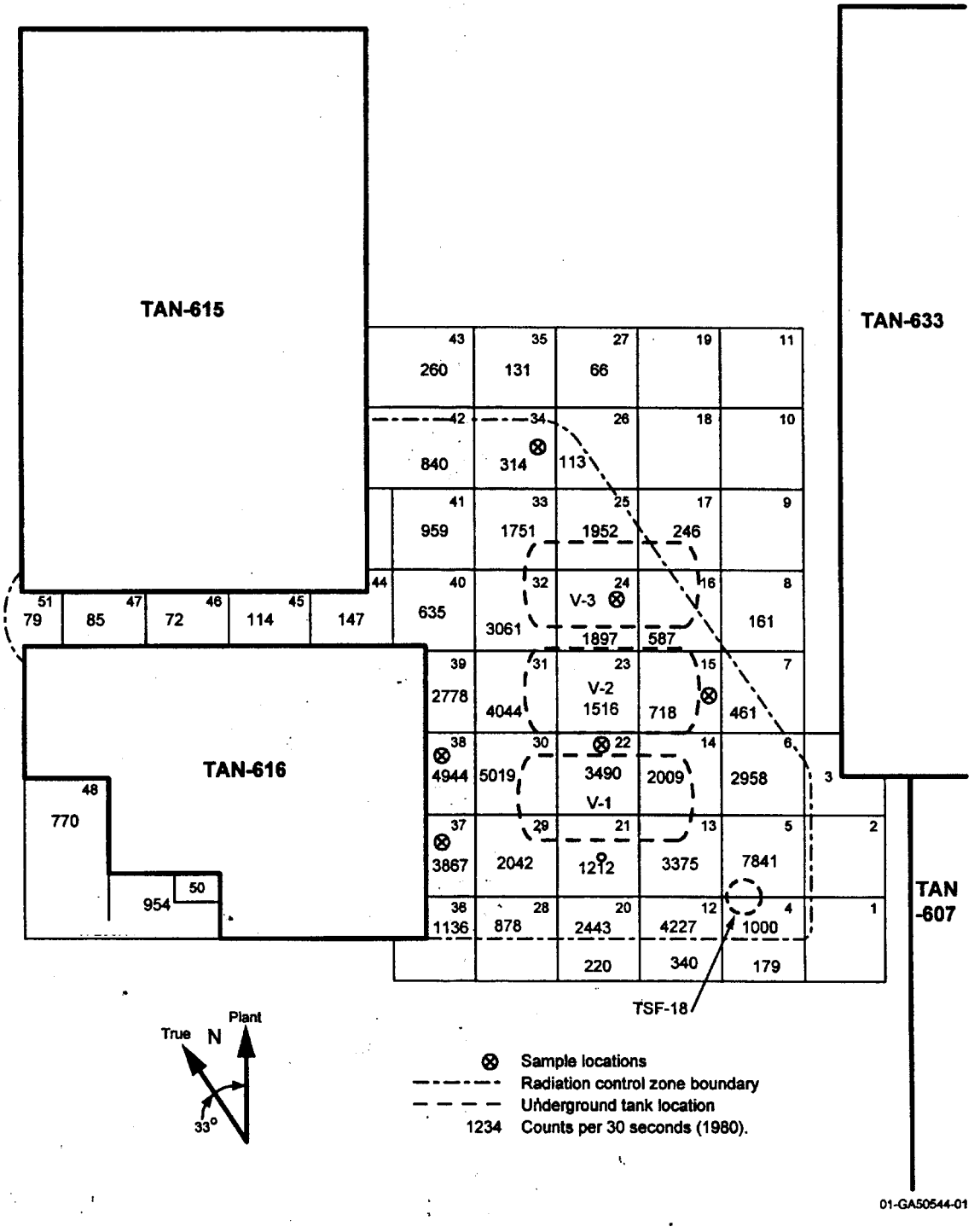

Figure C-1. Grid network for 1983 surface radiation survey and sample locations of V-Tanks.

Table C-3. Digital surface 1983 survey data, averaged over each square (counts/30 s).

Square Number	Inside Ribbon	Outside Ribbon	Square Number	Inside Ribbon	Outside Ribbon
1	Not staked	—	27	—	66 ± 6
2	Not staked	—	28	878 ± 21	—
3	Not staked	—	29	2,042 ± 32	—
4	1,000 ± 22	179 ± 9	30	5,019 ± 50	—
5	7,841 ± 63	—	31	4,044 ± 45	—
6	2,958 ± 38	—	32	3,061 ± 39	—
7	461 ± 15	333 ± 13	33	1,751 ± 30	—
8	—	161 ± 9	34	314 ± 13	—
9	Not staked	—	35	—	131 ± 8
10	Not staked	—	36	1,136 ± 24	—
11	Not staked	—	37	3,967 ± 45	—
12	4,227 ± 46	340 ± 13	38	3,944 ± 50	—
13	3,375 ± 41	—	39	2,778 ± 37	—
14	2,009 ± 32	—	40	635 ± 18	—
15	718 ± 19	—	41	959 ± 22	—
16	587 ± 17	231 ± 11	42	840 ± 20	—
17	—	246 ± 11	43	—	260 ± 11
18	Not staked	—	44	147 ± 9	—
19	Not staked	—	45	114 ± 8	—
20	2,443 ± 35	220 ± 10	46	72 ± 6	—
21	1,212 ± 25	—	47	85 ± 7	—
22	3,490 ± 42	—	48	770 ± 20	—
23	1,516 ± 27	—	49	Not staked	—
24	1,897 ± 31	—	50	945 ± 22	—
25	1,952 ± 31	—	51	79 ± 6	—
26	113 ± 8	—			—

Note: Error is one standard deviation of the average value of the two measurements for each square.
Note: Data are presented in counts/30 seconds. Readings should be doubled to convert to counts/minute.
— Inferred to mean nondetect.

Table C-4. Trench soil sampling results in 1983 V-Tank area—gamma-emitter activity (pCi/g).

Square	Depth (in.)	Cesium-137	Cobalt-60	Potassium-40	Cesium-134	Europium-154
15	Surface	79 ± 1	38 ± 1	9 ± 1	—	1.3 ± 0
	6	307 ± 3	376 ± 3	14 ± 2	—	—
	12	112 ± 2	64 ± 1	13 ± 2	—	—
	18	15 ± 1	0.8 ± 0.2	14 ± 2	—	—
	24	7 ± 1	0.5 ± 0.1	16 ± 2	—	—
	30	10 ± 1	0.6 ± 0.2	12 ± 2	—	—
	36	15 ± 1	14 ± 1	18 ± 3	—	—
22	Surface	1,074 ± 4	25 ± 3	9 ± 2	—	—
	6	2.0 ± 0.2	6.2 ± 0.5	10 ± 2	—	—
	12	16 ± 1	10 ± 1	14 ± 2	—	—
	18	2.9 ± 0.2	0.4 ± 0.1	10 ± 2	—	—
	24	2.9 ± 0.2	0.32 ± 0.08	10 ± 2	—	—
To be revised	B30	212 ± 2	460 ± 3	11 ± 2	—	—
	A36	1.7 ± 0.2	1.2 ± 0.2	4 ± 1	—	—
24	Surface	175 ± 2	32 ± 2	11 ± 2	0.9 ± 0.2	—
	6	40 ± 1	1.4 ± 0.2	6 ± 1	—	—
	12	54,120 ± 60	176 ± 7	17 ± 3	8 ± 4	—
	18	28 ± 1	0.5 ± 0.1	10 ± 2	—	—
	24	2.5 ± 0.2	0.22 ± 0.07	4.7 ± 0.9	—	—
	30	3.3 ± 0.3	0.8 ± 0.2	11 ± 2	—	—
	36	2.8 ± 0.4	0.7 ± 0.2	14 ± 2	—	—
34	Surface	106 ± 2	6.2 ± 0.5	8 ± 1	0.4 ± 0.2	—
	6	50 ± 1	16.2 ± 0.7	10 ± 2	—	—
	12	38 ± 1	1.2 ± 0.2	11 ± 2	—	—
	18	2.5 ± 0.2	—	9 ± 1	—	—
	24	0.2 ± 0.1	—	12 ± 2	—	—
	30	0.5 ± 0.1	—	14 ± 2	—	—
	36	1.7 ± 0.2	20 ± 1	10 ± 2	—	—
37	Surface	179 ± 2	52 ± 1	5 ± 1	—	—
	6	515 ± 3	30 ± 1	10 ± 2	—	—

Table C-4. (continued).

Square	Depth (in.)	Cesium-137	Cobalt-60	Potassium-40	Cesium-134	Europium-154
	12	0.24 ± 0.06	1.1 ± 0.2	9 ± 1	—	—
	18	45,800 ± 100	500 ± 10	—	16 ± 6	—
	24	16 ± 1	18 ± 1	14 ± 2	—	—
	30	420 ± 3	17 ± 1	9 ± 1	—	—
	36	20 ± 1	15 ± 1	10 ± 2	—	—
38	Surface	1,242 ± 5	610 ± 4	6 ± 2	2 ± 1	7 ± 1
	6	49 ± 1	2.9 ± 0.3	10 ± 2	—	—
	12	48 ± 1	4.6 ± 0.3	7 ± 1	—	—
	18	0.2 ± 0.1	0.2 ± 0.1	12 ± 2	—	—
	24	0.20 ± 0.5	—	8 ± 1	—	—
	30	—	—	5 ± 1	—	—
	36	3.0 ± 0.2	1.2 ± 0.2	4 ± 1	—	—

— Inferred to mean nondetect

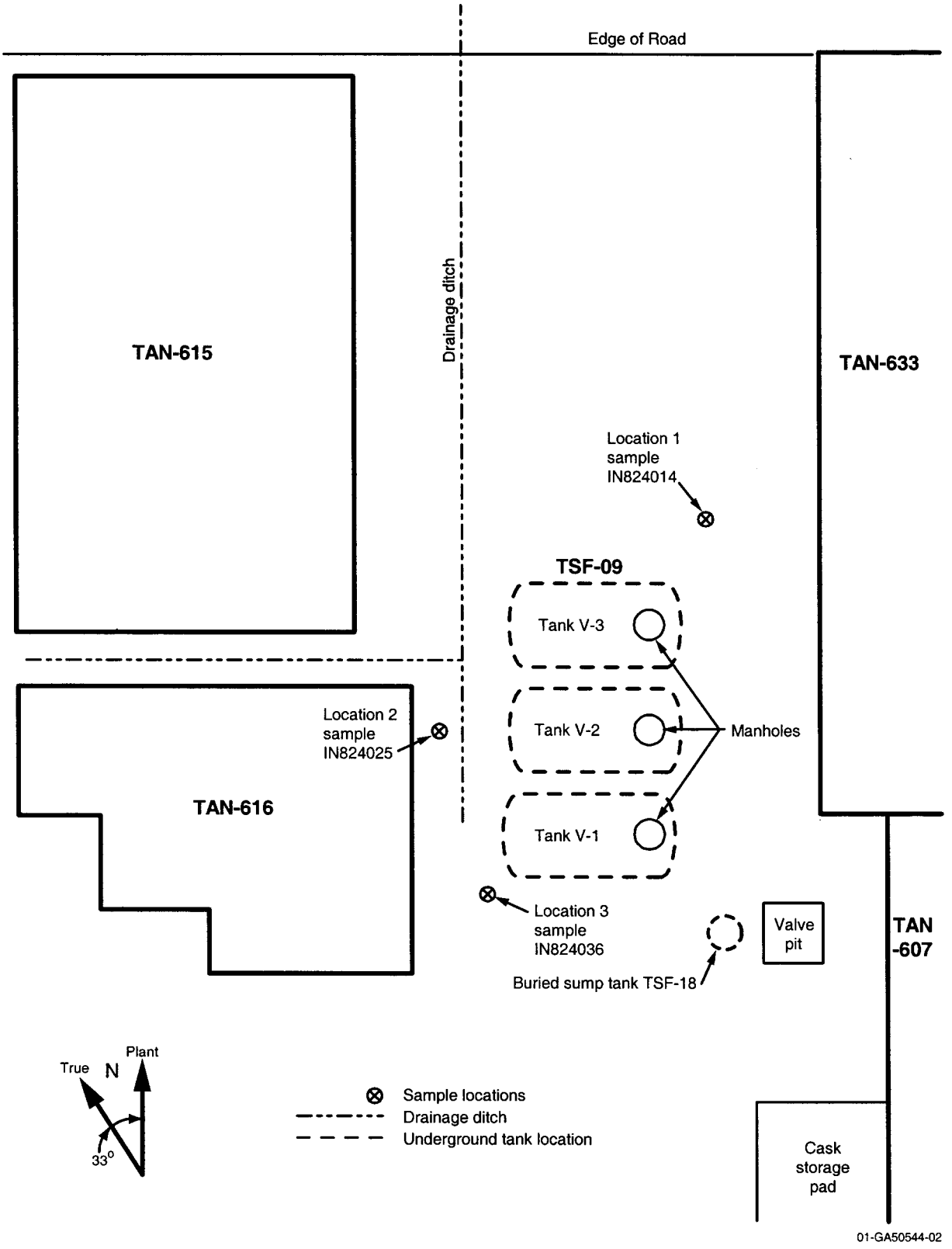

Figure C-2. The TSF-09 and TSF-18 1988 U.S. Department of Energy Environmental Survey sample locations.

Table C-5. The TSF-09 and TSF-18 1988 U.S. Department of Energy Environmental Survey sample analytical data from 0.3 to 0.6 m (1 to 2 ft).[a]

Field Measurements	Location 1 IN824014	Location 2 IN824025	Location 3 IN824036	90th Percentile of Elements at Test Area North	Risk-Based Concentrations
Beta/Gamma Analytes	0.5 mR/hr	2 mR/hr	0.2 mR/hr	N/A	N/A
Aluminum	10,100 mg/kg	16,300 mg/kg	13,400 mg/kg	20,800 mg/kg	N/A
Arsenic	8.6 mg/kg	8.6 mg/kg	9.9 mg/kg	38.4 mg/kg	80 mg/kg (0.4 mg/kg)
Barium	127 mg/kg	186 mg/kg	168 mg/kg	254 mg/kg	20,000 mg/kg
Beryllium	1.7 mg/kg	1.8 mg/kg	1.7 mg/kg	1.5 mg/kg	1,000 mg/kg (0.1 mg/kg)
Cadmium	1 mg/kg	1.1 mg/kg	1.1 mg/kg	4.6 mg/kg	100 mg/kg
Calcium	148,000 mg/kg	92,300 mg/kg	105,000 mg/kg	121,000 mg/kg	N/A
Chromium	22 mg/kg	32 mg/kg	25 mg/kg	38.9 mg/kg	N/A
Cobalt	4.9 mg/kg	7 mg/kg	6.3 mg/kg	13.3 mg/kg	N/A
Copper	14 mg/kg	22 mg/kg	20 mg/kg	27.4 mg/kg	10,000 mg/kg
Iron	12,700 mg/kg	19,100 mg/kg	16,500 mg/kg	27,000 mg/kg	N/A
Lead	8.1 mg/kg	14 mg/kg	13 mg/kg	55.6 mg/kg	N/A
Magnesium	11,600 mg/kg	12,900 mg/kg	12,300 mg/kg	14,300 mg/kg	N/A
Manganese	250 mg/kg	410 mg/kg	409 mg/kg	490 mg/kg	30,000 mg/kg
Mercury	0.12 mg/kg	0.08 mg/kg	0.08 mg/kg	0.06 mg/kg	N/A
Nickel	22 mg/kg	30 mg/kg	28 mg/kg	42.5 mg/kg	5,000 mg/kg
Potassium	2,500 mg/kg	3,800 mg/kg	3,000 mg/kg	5,480 mg/kg	N/A
Silver	0.96 mg/kg	1.1 mg/kg	1.1 mg/kg	3.5 mg/kg	1,000 mg/kg
Sodium	660 mg/kg	613 mg/kg	472 mg/kg	522 mg/kg	N/A
Vanadium	33 mg/kg	48 mg/kg	39 mg/kg	53.7 mg/kg	2,000 mg/kg
Zinc	67 mg/kg	101 mg/kg	98 mg/kg	182 mg/kg	80,000 mg/kg

a. Data exceeding the risk-based or background values are underlined (ITC 1994).

N/A = No concentration data are available.

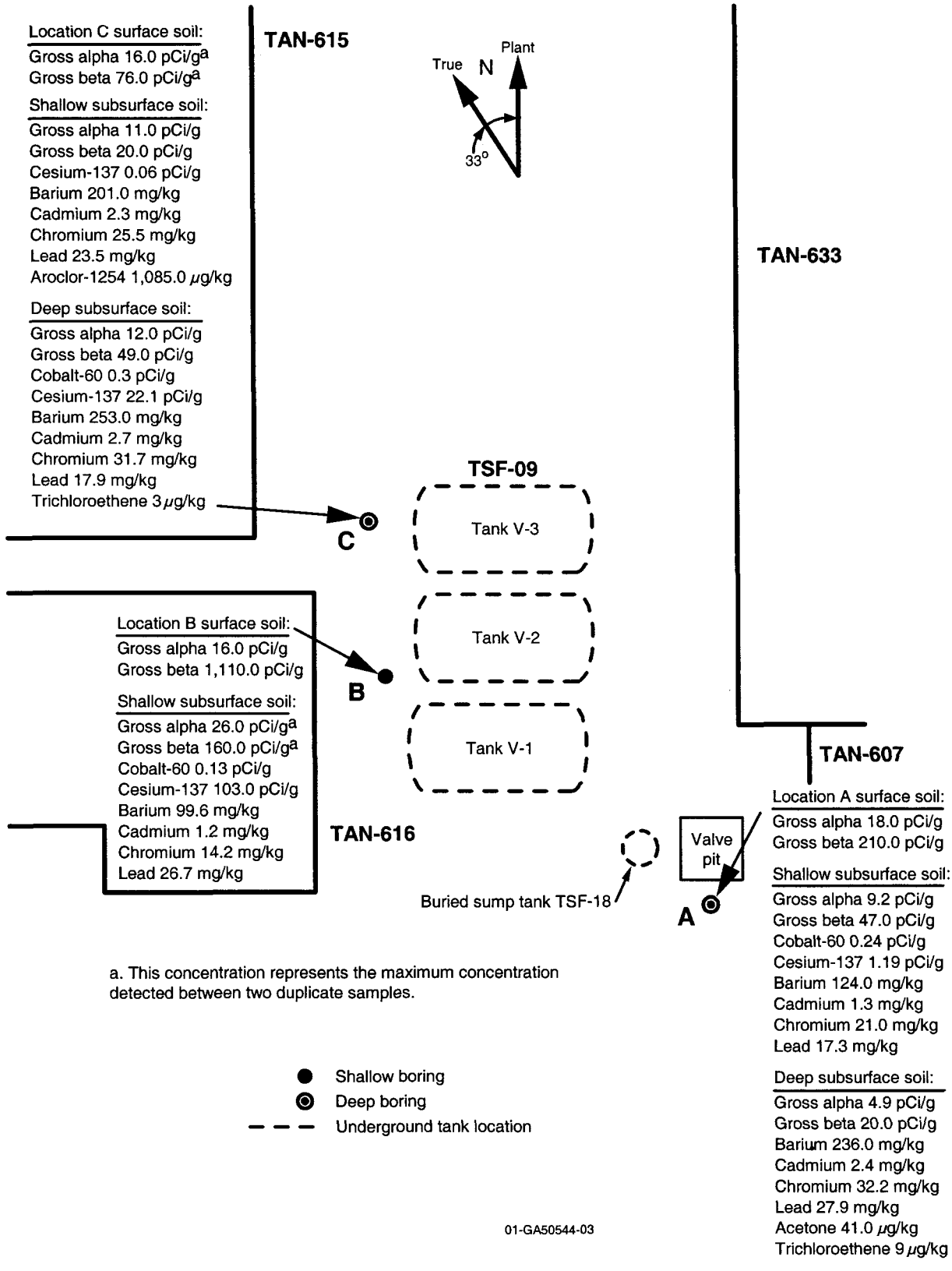

Figure C-3. The 1993 Phase II Track 2 environmental sample analytical results from the TSF-09 and TSF-18.

Table C-6. The 1993 Track 2 investigation, summary of analytes detected, and results.

Sample Number	Sample Location	Sample Depth	Sample Constituent	Sample Activity	Background Concentration
T0920001AB	A	0 to 0.15m	Gross alpha	18 ± 3.0 pCi/g	19.8 pCi/g[a]
T0920001AB		(0 to 0.5 ft)	Gross beta	210.0 ± 5.0 pCi/g	31.7 pCi/g[a]
T0910101AB	A	0 to 0.8 m	Gross alpha	9.2 ± 3.5 pCi/g	19.8 pCi/g[a]
T0910101AB		(0 to 2.5 ft)	Gross beta	47.0 ± 3.0 pCi/g	31.7 pCi/g[a]
T0910101R4			Cobalt-60	0.24 ± 0.03 pCi/g	N/A
T0910101R4			Cesium-137	1.2 ± 0.1 p/Ci/g	1.24 pCi/g[a]
T0905201AB	A	6.1 to 6.7 m	Gross alpha	4.9 ± 2.7 pCi/g U	19.8 pCi/g[a]
T0905201AB		(20 to 22 ft)	Gross beta	20.0 ± 2.0 pCi/g	31.7 pCi/g[a]
T0905201R4			Gamma	None detected	N/A
T0920101AB	B	0 to 0.15 m	Gross alpha	16.0 ± 4.0 pCi/g	19.8 pCi/g[a]
T0920101AB		(0 to 0.5 ft)	Gross beta	1,110.0 ± 10.0 pCi/g	31.7 pCi/g[a]
T0905501AB[c]	B	1.8 to 2.2 m	Gross alpha	26.0 ± 5.0 pCi/g	19.8 pCi/g[a]
T0905501AB[c]		(6 to 7 ft)	Gross beta	110.0 ± 5.0 pCi/g	31.7 pCi/g[a]
T0905602AB[c]	B	1.8 to 2.2 m	Gross alpha	21.0 ± 5.0 pCi/g	19.8 pCi/g[a]
T0905602AB[c]		(6 to 7 ft)	Gross beta	160.0 ± 5.0 pCi/g	31.7 pCi/g[a]
T0905602R4			Cobalt-60	0.13 ± 0.02 pCi/g	N/A
T0905602R4			Cesium-137	103.0 ± 7.4 pCi/g	1.24 pCi/g[b]
T0905602R4			Alpha spec.	0.8 ± 0.2 pCi/g	0.86 to 1.79 pCi/g
T0905602R4			Alpha spec.	0.3 ± 0.2 pCi/g	1.3 pCi/g
T0905602R4			Alpha spec.	0.7 ± 0.1 pCi/g	0.94 to 1.69 pCi/g
T0905602R4			Alpha spec.	0.01 ± 0.05 pCi/g	N/A
T0905602R4			Alpha spec.	0.7 ± 0.1 pCi/g	0.86 to 1.79 pCi/g
T0905602R4			Alpha spec.	0 ± 0.02 pCi/g	0.0005 to 0.0046 pCi/g
T0905602R4			Alpha spec.	0 ± 0.02 pCi/g	0.018 to 0.049 pCi/g
T0905602R4			Alpha spec.	0.01 ± 0.01 pCi/g	N/A
T0905602R4			Alpha spec.	0.03 ± 0.02 pCi/g	N/A
T0905602R4			Alpha spec.	0.03 ± 0.02 pCi/g	0.002 to 0.19 pCi/g
T0905602R4			Alpha spec.	0.25 ± 0.03 pCi/g	N/A
T0920201AB[c]	C	0 to 0.15 m	Gross alpha	16.0 ± 4.0 pCi/g	19.8 pCi/g[a]
T0920201AB[c]		(0 to 0.5 ft)	Gross beta	76.0 ± 3.0 pCi/g	31.7 pCi/g[a]

Table C-6. (continued).

Sample Number	Sample Location	Sample Depth	Sample Constituent	Sample Activity	Background Concentration
T0920202AB[c]	C	0 to 0.15 m	Gross alpha	13.0 ± 3.0 pCi/g	19.8 pCi/g[a]
T0920202AB[c]		(0 to 0.5 ft)	Gross beta	66.0 ± 13.0 pCi/g	31.7 pCi/g[a]
	C	0 to 0.8 m	Gross alpha	11.0 ± 5.0 pCi/g	19.8 pCi/g[a]
T0905601AB		(0 to 2.5 ft)	Gross beta	20.0 ± 2.0 pCi/g	31.7 pCi/g[a]
T0905601AB	C	0 to 0.8 m	Cesium-137	0.06 ± 0.02 pCi/g	1.24 pCi/g[b]
T0905702R4		(0 to 2.5 ft)			
	C	5.5 to 6.1 m	Gross alpha	12.0 ± 4.0 pCi/g	19.8 pCi/g[a]
T0905701AB		(18 to 20 ft)	Gross beta	49.0 ± 3.0 pCi/g	31.7 pCi/g[a]
T0905701AB	C	5.5 to 6.1 m	Cobalt-60	0.3 ± 0.0 pCi/g	N/A
T0910201R4		(18 to 20 ft)	Cesium-137	22.1 ± 1.6 pCi/g	1.24 pCi/g[b]
T0910201R4	A	0.8 to 1.4 m	Barium	124.0 mg/kg	254.0 mg/kg[d]
T0910101		(2.5 to 4.5 ft)	Cadmium	1.3 mg/kg	4.6 mg/kg[d]
			Chromium	21.0 mg/kg	38.9 mg/kg[d]
			Lead	17.3 mg/kg S	55.6 mg/kg[d]
T0905101	A	6.1 to 6.7 m	Barium	236.0 mg/kg	254.0 mg/kg[d]
		(20 to 22 ft)	Cadmium	2.4 mg/kg	4.6 mg/kg[d]
			Chromium	32.2 mg/kg	38.9 mg/kg[d]
			Lead	27.9 mg/kg S	55.6 mg/kg[d]
T0905601	B	1.8 to 2.2 m	Barium	99.6 mg/kg	254.0 mg/kg[d]
		(6 to 7 ft)	Cadmium	1.2 mg/kg	4.6 mg/kg[d]
			Chromium	14.2 mg/kg	38.9 mg/kg[d]
			Lead	26.7 mg/kg S	55.6 mg/kg[d]
T0905602	C	0 to 0.8 m	Barium	201.0 mg/kg	254.0 mg/kg[d]
		(0 to 2.5 ft)	Cadmium	2.3 mg/kg	4.6 mg/kg[d]
			Chromium	25.5 mg/kg	38.9 mg/kg[d]
			Lead	23.5 mg/kg S	55.6 mg/kg[d]
T0905702	C	5.5 to 6.1 m	Barium	253.0 mg/kg	254.0 mg/kg[d]
		(18 to 20 ft)	Cadmium	2.7 mg/kg	4.6 mg/kg[d]
			Chromium	31.7 mg/kg	38.9 mg/kg[d]
			Lead	17.9 mg/kg S	55.6 mg/kg[d]
T0910101	A	0.8 to 1.2 m	Acetone	7 μg/kg J	N/A
		(2.5 to 4 ft)			

Table C-6. (continued).

Sample Number	Sample Location	Sample Depth	Sample Constituent	Sample Activity	Background Concentration
T0910101	A	6.1 to 7.4 m (20 to 24 ft)	Acetone	41 µg/kg	N/A
			Trichloroethane	9 µg/kg	N/A
T0910201	C	6.1 to 6.7 m (20 to 22 ft)	Trichloroethane	3 µg/kg	N/A
T0905702	C	0 to 0.8 m (0 to 2.5 ft)	Aroclor-1254	1,085 µg/kg	N/A

Mean of range for Cesium-137 (0.4 to 2.08 pCi/g) taken from *Track 2 Sites: Guidance for Assessing Low Probability Hazard Sites at the INEL* (DOE-ID 1994), p. E-11.
Field duplicate samples.
90^{th} percentile value taken from *Track 1 Sites: Guidance for Assessing Low Probability Hazard Sites at the INEL* (DOE-ID 1992).
J = Indicates an estimated value.
U = The constituent of interest was analyzed for, but was not detected above the minimum detectable activity of the instrumentation. There may or may not be a result provided in the data package. If no result is provided, a "zero" result should not be entered in its place, as the zero may mistakenly be included in statistical calculations performed from the sample results.
S = The value was determined by the method of standard addition.
N/A = No background concentration data.

Table C-7. Target compound list of volatile organic compound analytical results for the 1993 TSF-09 and TSF-18 boring subsurface soil samples.

Analytical Parameter	Location A		Location B		Location C	
	Sample Number T0910101VL (2.5 to 4 ft)	Sample Number T0910101VM (22 to 24 ft)	Sample Number T0905601VL[a] (7 to 8 ft)	Sample Number T0905602VL[a] (7 to 8 ft)	Sample Number T0910202VL (2.5 to 4.5 ft)	Sample Number T0910201VL (20 to 22 ft)
Chloromethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Bromomethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Vinyl chloride	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Chloroethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Methylene chloride	11 µg/kg U	27 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Acetone	7 µg/kg J	41 µg/kg	12 µg/kg U	11 µg/kg U	15 µg/kg U	12 µg/kg U
Carbon disulfide	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
1,1-Dichloroethene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
1,1-Dichloroethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
1,2-Dichloroethene (total)	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Chloroform	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
1,2-Dichloroethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
2-Butanone	11 µg/kg R	12 µg/kg R	12 µg/kg R	11 µg/kg R	12 µg/kg R	12 µg/kg R
1,1,1-Trichloroethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Carbon tetrachloride	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Bromodichloromethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
1,2-Dichloropropane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
cis-1,3-Dichloropropene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Trichlorethene	11 µg/kg U	9 µg/kg J	12 µg/kg U	11 µg/kg U	12 µg/kg U	3 µg/kg J
Dibromochloromethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U

Table C-7. (continued).

Analytical Parameter	Location A		Location B		Location C	
	Sample Number T0910101VL (2.5 to 4 ft)	Sample Number T0910101VM (22 to 24 ft)	Sample Number T0905601VL[a] (7 to 8 ft)	Sample Number T0905602VL[a] (7 to 8 ft)	Sample Number T0910202VL (2.5 to 4.5 ft)	Sample Number T0910201VL (20 to 22 ft)
1,1,2-Trichloroethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Benzene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
trans-1,3-Dichloropropene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Bromoform	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
4-Methyl-2-pentanone	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
2-Hexanone	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Tetrachloroethene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
1,1,2,2-Tetrachloroethane	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Toluene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Chlorobenzene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Ethylbenzene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Styrene	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U
Xylenes (total)	11 µg/kg U	12 µg/kg U	12 µg/kg U	11 µg/kg U	12 µg/kg U	12 µg/kg U

a. Field duplicate sample.
U = Indicates the compound was analyzed for, but not detected.
R = The data are unusable (may or may not be present). Resampling and reanalysis are necessary for verification.
J = Indicates an estimated value.

Table C-8. Target compound list of semivolatile organic compounds analytical results for the 1993 Phase II TSF-09 and TSF-18 boring subsurface soil.

	Location A		Location B		Location C	
Analytical Parameter	Sample Number T0910101EL 0.8 to 1.2 m (2.5 to 4 ft)	Sample Number T0905201EL 6.7 to 7.4 m (22 to 24 ft)	Sample Number T0905601EL 1.5 to 1.9 m (5 to 6 ft)	Sample Number T0905602EL 1.5 to 1.9 m (5 to 6 ft)	Sample Number T0905702EL 0.8 to 1.4 m (2.5 to 4.5 ft)	Sample Number T0905701EL 6.1 to 6.7 m (20 to 22 ft)
Phenol	360 µg/kg U[a]	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
bis(2-Chloroethyl)ether	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2-Chlorophenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
1,3-Dichlorobenzene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
1,4-Dichlorobenzene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
1,2-Dichlorobenzene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2-Methylphenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,2'-Oxybis(1-chloropropane)	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
4-Methylphenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
n-Nitroso-di-n-propylamine	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Hexachloroethane	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Nitrobenzene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Isophorone	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2-Nitrophenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,4-Dimethylphenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
bis(2-Chloroethoxy)methane	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,4-Dichlorophenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
1,2,4-Trichlorobenzene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Naphthalene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
4-Chloroaniline	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Hexachlorobutadiene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U

Table C-8. (continued).

Analytical Parameter	Location A		Location B		Location C	
	Sample Number T0910101EL 0.8 to 1.2 m (2.5 to 4 ft)	Sample Number T0905201EL 6.7 to 7.4 m (22 to 24 ft)	Sample Number T0905601EL 1.5 to 1.9 m (5 to 6 ft)	Sample Number T0905602EL 1.5 to 1.9 m (5 to 6 ft)	Sample Number T0905702EL 0.8 to 1.4 m (2.5 to 4.5 ft)	Sample Number T0905701EL 6.1 to 6.7 m (20 to 22 ft)
4-Chloro-3-methylphenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2-Methylnaphthalene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Hexachlorocyclopentadiene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,4,6-Trichlorophenol	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,4,5-Trichlorophenol	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
2-Chloronaphthalene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2-Nitroaniline	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
Dimethylphthalate	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Acenaphthylene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,6-Dinitrotoluene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
3-Nitroaniline	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
Acenaphthene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,4-Dinitrophenol	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
4-Nitrophenol	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
Dibenzofuran	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
2,4-Dinitrotoluene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Diethylphthalate	420 µg/kg U	490 µg/kg U	390 µg/kg U	370 µg/kg U	500 µg/kg U	480 µg/kg U
4-Chlorophenyl-phenylether	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Fluorene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
4-Nitroaniline	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
4,6-Dinitro-2-methylphenol	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U

Table C-8. (continued).

Analytical Parameter	Location A		Location B		Location C	
	Sample Number T0910101EL 0.8 to 1.2 m (2.5 to 4 ft)	Sample Number T0905201EL 6.7 to 7.4 m (22 to 24 ft)	Sample Number T0905601EL 1.5 to 1.9 m (5 to 6 ft)	Sample Number T0905602EL 1.5 to 1.9 m (5 to 6 ft)	Sample Number T0905702EL 0.8 to 1.4 m (2.5 to 4.5 ft)	Sample Number T0905701EL 6.1 to 6.7 m (20 to 22 ft)
n-Nitrosodiphenylamine (1)	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
4-Bromophenyl-phenylether	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Hexachlorobenzene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Pentachlorophenol	900 µg/kg U	1,000 µg/kg U	980 µg/kg U	930 µg/kg U	1,000 µg/kg U	980 µg/kg U
Phenanthrene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Anthracene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Carbazole	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
di-n-Butylphthalate	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Fluoranthene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Pyrene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Butylbenzylphthate	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
3,3'-Dichlorobenzidine	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Benzo(a)anthracene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Chrysene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
bis(2-Ethylexyl)phthalate	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
di-n-Octylphthalate	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Benzo(k)fluoranthene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Benzo(a)perylene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Indeno(1,2,3-cd)pyrene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U
Dibenzo(a,h)anthracene	360 µg/kg U	400 µg/kg U	390 µg/kg U	370 µg/kg U	410 µg/kg U	390 µg/kg U

Table C-9. Polychlorinated biphenyl analytical results for the 1993 Phase II TSF-09 and TSF-18 boring subsurface soil samples.

	Location A		Location B		Location C	
Analytical Parameter	Sample Number T0910101PC 0.76 to 1.22 m (2.5 to 4 ft)	Sample Number T0905201PC 6.1 to 6.71 m (20 to 22 ft)	Sample Number T0905601PC[a] 1.5 to 1.8 m (5 to 6 ft)	Sample Number T0905602PC[a] 1.5 to 1.8 m (5 to 6 ft)	Sample Number T0905702PC 0 to 0.76 m (0 to 2.5 ft)	Sample Number T0910201PC 5.5 to 6.71 m (18 to 20 ft)
Aroclor-1016	87 µg/kg U	97 µg/kg U	95 µg/kg U	89 µg/kg U	490 µg/kg UD	94 µg/kg U
Aroclor-1221	87 µg/kg U	97 µg/kg U	95 µg/kg U	89 µg/kg U	490 µg/kg UD	94 µg/kg U
Aroclor-1232	87 µg/kg U	97 µg/kg U	95 µg/kg U	89 µg/kg U	490 µg/kg UD	94 µg/kg U
Aroclor-1242	87 µg/kg U	97 µg/kg U	95 µg/kg U	89 µg/kg U	490 µg/kg UD	94 µg/kg U
Aroclor-1248	87 µg/kg U	97 µg/kg U	95 µg/kg U	89 µg/kg U	490 µg/kg UD	94 µg/kg U
Aroclor-1254	170 µg/kg U	190 µg/kg U	190 µg/kg U	180 µg/kg U	1,085 µg/kg D	190 µg/kg U
Aroclor-1260	170 µg/kg U	190 µg/kg U	190 µg/kg U	180 µg/kg U	980 µg/kg UD	190 µg/kg U

[a] Field duplicate samples.
U = Indicates the compound was analyzed for, but not detected.
D = Identifies all compounds identified in an analysis at a secondary dilution factor.

Table C-10. Phase II inorganic analytical results for the 1993 TSF-09 and TSF-18 boring subsurface soil samples.

Sample Number	Sample Location	Sample Depth	Analytes					
			Barium	Cadmium	Chromium	Lead	Mercury	Silver
T0910101LM	A	2.5 to 4 ft	124.0 mg/kg	1.3 mg/kg	21.0 mg/kg	17.3 mg/kg S	0.05 mg/kg U	0.22 mg/kg U
T0905101LM	A	20 to 22 ft	236.0 mg/kg	2.4 mg/kg	32.2 mg/kg	27.9 mg/kg S	0.06 mg/kg U	0.24 mg/kg U
T0905610LM	B	6 to 7 ft	99.6 mg/kg	1.2 mg/kg	14.2 mg/kg	26.7 mg/kg S	0.15 mg/kg U	0.24 mg/kg U
T0905602LM	C	0 to 2.5 ft	201.0 mg/kg	2.3 mg/kg	25.5 mg/kg	23.5 mg/kg S	0.09 mg/kg BU	0.23 mg/kg U
T0905702LM	C	18 to 20 ft	253.0 mg/kg	2.7 mg/kg	31.7 mg/kg	17.9 mg/kg S	0.06 mg/kg U	0.24 mg/kg U

S = Value was determined by the MSA.
U = Indicates the analyte was analyzed for, but not detected.
B = Value is less than the contract-required detection limit, but greater than the instrument detection limit.

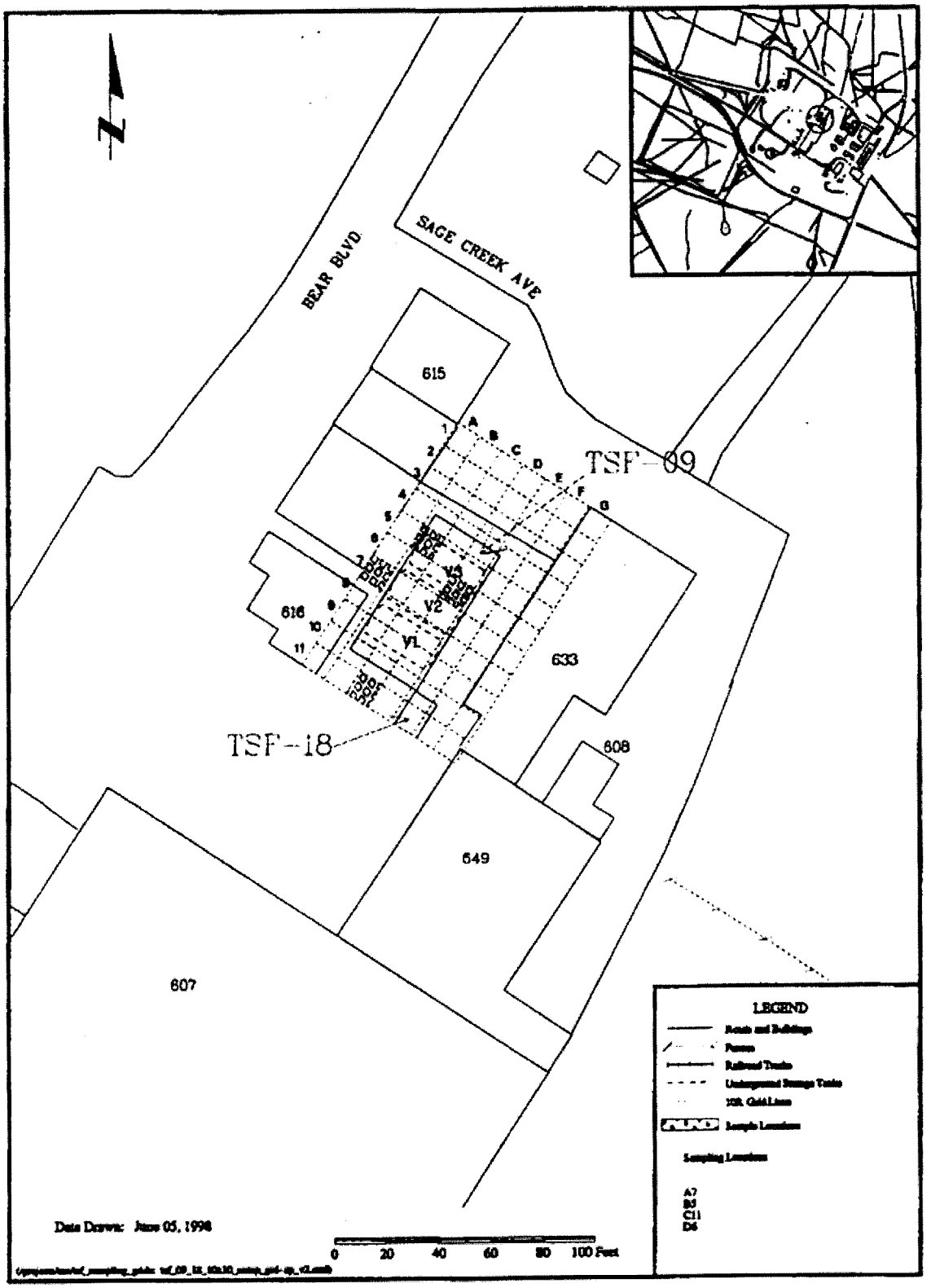

Figure C-4. The TSF-09 and TSF-18 1998 soil sampling grid.

Table C-11. Soil sampling resultsfor 1998 soil surrounding V-Tanks.

Sample ID	Dilution Factors TCLP VOCs/ VOCs/PCBs/ Metals	Sample Date	Grid	Interval (ft) Min	Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	TCLP Vinyl Chloride		TCLP 1,1-Dichloro-ethene		TCLP Chloro-form		TCLP 1,2-Dichloro-ethane		TCLP 2-Butanone	
										ug/L	flag	ug/L	flag	ug/L	flag	ug/L	flag	ug/L	flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed										
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	97	J
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998										
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	75	J
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	100	U	50	U	50	U	50	U	200	U
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	100	U	50	U	50	U	50	U	94	J
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples Taken for Physical Properties Only													
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples Taken for Physical Properties Only													
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples Taken for Physical Properties Only													

Table C-11. (continued).

Sample ID	Dilution Factors TCLP VOCs/ VOCs/PCBs/ Metals	Sample Date	Grid	Interval (ft) Min	Interval (ft) Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	TCLP Carbon Tetra-chloride ug/L	flag	TCLP Trichloro-ethene ug/L	flag	TCLP Benzene ug/L	flag	TCLP Tetrachloro-ethene ug/L	flag	TCLP Chloro-benzene ug/L	flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed										
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998										
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	UJ	50	U
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	50	U	50	U	50	U	50	U	50	U
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples were taken for physical properties only.													
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples were taken for physical properties only.													
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples were taken for physical properties only.													

Table C-11. (continued).

Sample ID	Dilution Factors TCLP VOCs/ VOCs/PCBs/ Metals	Sample Date	Grid	Interval (ft) Min	Interval (ft) Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	SW-846 8260A Methylene Chloride ug/kg	flag	SW-846 8260A 1,1,1-Trichloro-ethane ug/kg	flag	SW-846 8260A Carbon Tetrachloride ug/kg	flag	SW-846 8260A Trichloro-ethene ug/kg	flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed	5 ug/L	U	5 ug/L	U	5 ug/L	U	5 ug/L	U
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	6	U	5	U	5	U	5	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	3	J
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	6	U	6	U	6	U	6	U
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	6	U	6	U	6	U	2	J
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples were taken for physical properties only.											
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples were taken for physical properties only.											
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples were taken for physical properties only.											

Table C-11. (continued).

Sample ID	Dilution Factors TCLPVOCs/ VOCs/PCBs/ Metals	Sample Date	Grid	Interval (ft) Min	Interval (ft) Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	SW-846 8260A Tetrachloro-ethene ug/kg	flag	Aroclor-1016 ug/kg	flag	Aroclor-1221 ug/kg	flag	Aroclor-1232 ug/kg	flag	Aroclor-1242 ug/kg	flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed	5 ug/L	U	1 ug/L	U	1 ug/L	U	1 ug/L	U	1 ug/L	U
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	5	U	33	U	33	U	33	U	33	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998	6	U	33	UJ	33	UJ	33	UJ	33	UJ
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	6	U	33	UJ	33	UJ	33	UJ	33	UJ
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	6	U	33	U	33	U	33	U	33	U
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	6	U	33	UJ	33	UJ	33	UJ	33	UJ
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples were taken for physical properties only.													
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples were taken for physical properties only.													
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples were taken for physical properties only.													

Table C-11. (continued).

Sample ID	Dilution Factors TCLP VOCs/VOCs/ PCBs/Metals	Sample Date	Grid	Interval (ft) Min	Interval (ft) Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	Aroclor-1248 ug/kg	Aroclor-1248 flag	Aroclor-1254 ug/kg	Aroclor-1254 flag	Aroclor-1260 ug/kg	Aroclor-1260 flag	Aroclor-1262 ug/kg	Aroclor-1262 flag	Aroclor-1268 ug/kg	Aroclor-1268 flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed	1 ug/L	U	1 ug/L	U	1 ug/L	U	1 ug/L	U	1 ug/L	U
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	33	U	44		33	U	33	U	33	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	33	U	33	U	53	J	33	U	33	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998	33	UJ	33	UJ	33	UJ	33	UJ	33	UJ
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	33	UJ	33	UJ	33	UJ	33	UJ	33	UJ
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	33	U	33	U	33	U	33	U	33	U
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	33	UJ	33	UJ	33	UJ	33	UJ	33	UJ
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples were taken for physical properties only.													
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples were taken for physical properties only.													
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples were taken for physical properties only.													

Table C-11. (continued).

Sample ID	Dilution Factors TCLP VOCs/ VOCs/PCBs/ Metals	Sample Date	Grid	Interval (ft) Min	Interval (ft) Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	SW-846 3010 Arsenic ug/L	flag	SW-846 3010 Barium ug/L	flag	SW-846 3010 Cadmium ug/L	flag	SW-846 3010 Chromium ug/L	flag	SW-846 3010 Lead ug/L	flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed										
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	20.8	U	1339		7.4	B	4	U	47.9	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	20.8	U	1519		6	B	4	U	47.9	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	20.8	U	1390		5.3	B	4	U	47.9	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	20.8	U	923		5.2	B	4	U	47.9	U
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998	20.8	U	1273		5.1	B	4	U	47.9	U
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	20.8	U	1623		4.3	U	4	U	47.9	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	20.8	U	1948		5.8	B	4	U	47.9	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	20.8	U	2335		12.6	B	4	U	47.9	U
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	20.8	U	1371		5.9	B	4	U	47.9	U
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	20.8	U	1516		6.1	B	4	U	47.9	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	20.8	U	2150		6.3	B	4	U	47.9	U
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	20.8	U	2369		11.8	B	4.3	B	47.9	U
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	20.8	U	1786		7	B	4	U	47.9	U
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples were taken for physical properties only.													
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples were taken for physical properties only.													
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples were taken for physical properties only.													

Table C-11. (continued).

Sample ID	Dilution Factors TCLP VOCs/ VOCs/PCBs/ Metals	Sample Date	Grid	Interval (ft) Min	Interval (ft) Max	Date Analyzed TCLP VOCs	Date Analyzed CLP VOCs	Date Analyzed PCBs	Date Analyzed RCRA Metals	SW-846 7470 Mercury ug/L	flag	SW-846 3010 Nickel ug/L	flag	SW-846 3010 Selenium ug/L	flag	SW-846 3010 Silver ug/L	flag
1WG00101	NA/1/1/NA	6/29/1998	QC	NA	NA	Not Analyzed	7/10/1998	8/15/1998	Not Analyzed								
1WG00201	10/1/1/Unknown	6/29/1998	A7	0	2.5	7/17/1998	7/10/1998	8/15/1998	7/17/1998	0.14	UJ	11.2	B	25.4	UJ	7.1	U
1WG00301	10/1/1/Unknown	6/30/1998	B5	0	2.5	7/18/1998	7/13/1998	8/15/1998	7/17/1998	0.14	J	12.5	B	25.4	UJ	7.1	U
1WG00401	10/1/1/Unknown	6/29/1998	C10	0	2.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	0.14	UJ	16.1	B	25.4	UJ	7.1	U
1WG00501	10/1/1/Unknown	6/30/1998	D6	0	2.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	0.14	UJ	9.9	B	25.4	UJ	7.1	U
1WG00502	NA/1/1/Unknown	6/30/1998	D4	0	2.5	Not Analyzed	7/12/1998	9/3/1998	7/17/1998	0.14	UJ	8.5	B	25.4	UJ	7.1	U
1WG00601	10/1/1/Unknown	6/29/1998	A7	5	7.5	7/20/1998	7/10/1998	8/15/1998	7/17/1998	0.14	UJ	7.1	B	25.4	UJ	7.1	U
1WG00701	10/1/1/Unknown	6/30/1998	B5	5	7.5	7/18/1998	7/11/1998	8/15/1998	7/17/1998	0.14	UJ	11.8	B	25.4	UJ	7.1	U
1WG00801	10/1/1/Unknown	6/29/1998	C10	5	7.5	7/17/1998	7/9/1998	8/15/1998	7/17/1998	0.14	UJ	29.2	B	25.4	UJ	8.9	B
1WG00901	10/1/1/Unknown	6/30/1998	D6	5	7.5	7/18/1998	7/12/1998	9/3/1998	7/17/1998	0.18	J	10.1	B	25.4	UJ	7.1	U
1WG01001	10/1/1/Unknown	6/29/1998	A7	7.5	10	7/20/1998	7/10/1998	8/15/1998	7/17/1998	0.16	J	16.9	B	25.4	UJ	7.1	U
1WG01101	10/1/1/Unknown	6/30/1998	B5	7.5	10	7/18/1998	7/11/1998	8/15/1998	7/17/1998	0.14	UJ	14.5	B	25.4	UJ	7.1	U
1WG01201	10/1/1/Unknown	6/29/1998	C10	7.5	10	7/17/1998	7/10/1998	8/15/1998	7/17/1998	0.2	J	25.2	B	25.4	UJ	8.9	B
1WG01301	10/1/1/Unknown	6/30/1998	D6	7.5	10	7/20/1998	7/12/1998	9/3/1998	7/17/1998	0.34	J	15.2	B	25.4	UJ	7.1	U
1WG01401	NA/NA/NA	6/30/1998	D6	10	12.5	Samples were taken for physical properties only.											
1WG01501	NA/NA/NA	6/30/1998	D6	15	17.5	Samples were taken for physical properties only.											
1WG01601	NA/NA/NA	6/30/1998	D6	17.5	20	Samples were taken for physical properties only.											

Appendix D

Agency Response Comments

INEEL

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Group 2 Sites (Draft) DOE/ID 11075

DATE: March 28, 2003 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
GENERAL COMMENTS				
SPECIFIC COMMENTS				
1	1.2.1.	1-3	Second Paragraph, second sentence: This sentence should be changed slightly to say "Soil contamination attributable to the V-Tanks *activity*... " As presently written, the wording could be construed to indicate leakage from the V-Tanks, which has not been shown to date to have occurred	Comment accepted.
2	1.2.1	1-3	Second Paragraph Second to last sentence: Several non-CERCLA components are noted as being located within the area of contamination. However, the only one mentioned and shown on Figure 1-1 is the TAN-1704 valve pit. Please reference the other non-CERCLA components that the project may encounter and where they are expected to be located	Comment accepted. The paragraph now contains a reference to Figure 6-1. These components are shown in Figure 6-1
3	1.2.1	1-3	Third Paragraph: It would be helpful if drawings or figures were provided or referenced that would illustrate how the waste was transferred from sumps and drains through the piping and valves into the tanks.	Comment noted. The following has been added to the paragraph: "Details of the action are described in Section 6 and shown in Figures 6-1 and 6-2. The other non-CERCLA components are discussed in detail in the HWMA/RCRA Closure Plan for the TAN/TSF Intermediate Level Radioactive Waste Management System, Phase I Treatment Subsystem (DOE-ID 2003)."

INEEL

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Group 2 Sites (Draft) DOE/ID 11075

DATE: March 28, 2003 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
4	1.2.1	1-3	Third Paragraph, Third Sentence: It appears that sections 1.2.2.1 and 1.2.2.3 were omitted. Please add if these sections are still meant to be included in this document. If these sections refer to the document referenced (INEEL 2001a), please reword for clarity.	Comment accepted. Sentence has been corrected to reference Sections 1.2.1.1 through 1.2.1.3
5	1.2.1.1	1-5	This section should state whether or not there is any piping associated with the sand filter.	Comment accepted. The following sentence has been added to the first paragraph. "No pipes are associated with the sand filter."
6	1.2.1.2	1-5	First Paragraph, last sentence: If additional contamination may have originated from runoff from the adjacent cask storage pad, then this area should be included as part of the AOC. Please discuss the nature of activities at the cask storage pad, and explain why it is not discussed elsewhere as a possible area for further investigation if it is being associated with windblown contamination.	Comment accepted. Sentence was re-written to say...Additional contamination may have originated from windblown contaminant transport ...
7	1.2.1.2	1-5	Second Paragraph, Third Sentence: The scale on Figure 1-1 shows the TSF-09 site to be approximately 25'x 40'. TSF-18 appears to be 10'x 10' Together they do not quite appear to equal the estimated 50' by 80' as the section describes. No scale is indicated on Figure 1-2 where the AOC is outlined. It is recommended that one be included to help provide a perspective for the size of the AOC .	A scale will be added to Figure 1-2.

INEEL

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Group 2 Sites (Draft) DOE/ID 11075

DATE: March 28, 2003 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
8	1.2.1.3	1-5	First Paragraph, Second Sentence: The middle part of this sentence is written in a temporal sense, i.e., it should say "...concurrent with the early remedial action, and will be managed..." leaving out "CERCLA RD/RA WP addendum". If the intention is to retain the latter wording, the sentence should be rewritten as "...Group 2 sites will be removed *in concurrence* with the early remedial action CERCLA RD/RA WP addendum..."	Comment accepted. "CERCLA RD/RA WP Addendum" has been deleted.
9	Fig 1-2	1-6	Please label the valve pit (official letter and number designation) shown on Figure 1-2.	Comment accepted. Valve pit will be labeled.
10	1.2.1.3	1-7	First Paragraph, Third Sentence: Please provide a description and location (possibly Figure 1-2) for TAN-666, since no other figure within the document reveals where this building is located.	TAN 666 has been corrected to TAN 616.
11	1.2.1.3	1-7	Second Paragraph: Please provide a status for the liquid that was found in the base of the valve pit. What will be its status and fate in terms of removal, treatment (as part of VCO RCRA action?), etc.	Comment accepted. A sentence has been added to the end of the second paragraph to clarify that the pit and it's contents are being closed under RCRA. " The TAN-1704 valve pit and its contents are being closed under the HWMA/RCRA Closure Plan for the Tan/TSF Intermediate-Level Radioactive Waste Management System, Phase I: Treatment Subsystem (TAN-616) (DOE/ID 2003).
12	1.3	1-7	First Bullet: Please delete "the" before "Tank V-9". In the second sentence, the use of "isolation" after "Tank V-9" is not clear.	First bullet, comment accepted, "the" deleted. Second sentence re-written to say "Removing debris such as concrete tank cradles and piping that would interfere with excavation to isolate Tank V-9.

INEEL

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Group 2 Sites (Draft) DOE/ID 11075

DATE: March 28, 2003 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
13	2.2	2-1	Second Paragraph: a) Although it is assumed that any fluids used for flushing of the V-9 Tank piping will be minimal in volume if this action is necessary, please ensure that any additional liquids in Tanks V-1 and V-2 will not have a negative impact on the remedial action for these tanks. b) Following this description of proposed activities is *difficult to follow/visualize. Figure 6-2 provides a very* illustrative cross-section that could be referenced for Section 2.2. Please consider moving the same Figure into Section 2.0 (and renaming it to comport with the section) or reference Figure 6-2 in the latter section. The way it is currently stated, the liquid that is flushed will end up in TAN –616 and Tanks V-1 and V-2. If the intent is to flush the liquid from V-9 through the valve system in the basement of TAN-616 into Tanks V-1 or V-2, then the sentence should be reworded	a) Comment accepted. The following sentence has been added to the paragraph. "Placing this additional liquid in Tanks V-1 and V-2 will not have a negative impact on the remedial action for these tanks. b) Comment accepted. The third sentence was re-worded "The flush would be from the V-9 outlet through "downstream" piping via the valve system in the basement of TAN 616 into Tank V-1 or V-2 for proper management." "This is further discussed in Section 6 and shown in Figure 6-2" has been added to the paragraph.
14	2.3	2-2	Second bullet: This bullet apparently contradicts what is currently written in Section 2.2, second paragraph, second to the last sentence, Page 2-1: "If liquid is observed in the lines, it will be drained back into TAN-616 and Tanks V-1 or V-2 for proper management." Please clarify.	Comment accepted. Moving the last sub-bullet ("Potentially flushing lines...") to come before the ("Isolating piping ...") sub bullet eliminates the contradiction.
15	Table 2-1	2-7	Institutional Controls are codified in several regulations including 40 CFR 194.43, 40 CFR 300.430 Subpart E (RI/FS and Selection of Remedy), 40 CFR 194.41, 40 CFR 300.435 (RD/RA, O&M). They should be considered as ARARs, not TBCs.	EPA's Region 10 Final Policy on Using Institutional Controls at Federal Facilities is listed as a to-be-considered guidance in the TAN ROD. This table reflects the V-Tanks ARARs table in the ROD.

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PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Group 2 Sites (Draft) DOE/ID 11075

DATE: March 28, 2003 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
16	3	3-1	Second Paragraph: It should be mentioned that this is only a partial list of uncertainties that have been analyzed. Additional uncertainties include items in section "4.1 Design Assumptions for the Early Remedial Action". For example the piping to be removed is assumed to be intact, and will be located where shown on the as-built INEEL drawings. Please indicate that there are a number of other uncertainties not mentioned here.	Comment accepted. "Additional project uncertainties are addressed in Section 4.1 Design Assumptions for the Early Remedial Action" has been added.
17	3	3-1	Additional Bullet: Please consider providing an additional bullet that addresses "Weather Impacts" to the list of uncertainties that should be considered as an unforeseen event that could negatively affect the execution of the proposed remedial tasks.	Comment accepted, the following sentences on weather impacts to schedule have been added to Schedule Contingencies: "Adverse weather may impact field activities, this has been addressed by scheduling the field work to occur during the summer months. Schedule impacts during the summer due to adverse weather are expected to be minor."
18	4.3.1	4-3	References to the piping diagrams of Figures 6-1 and 6-2 would benefit the reader while reviewing these field descriptions.	Comment accepted. A reference to Figures 6-1 and 6-2 has been added to the second paragraph.
19	6.1.1	6-2	First Paragraph: Although it is mentioned several times that a prefinal inspection by the agencies will not be conducted for the early remedial action, it should also mention that a prefinal inspection would accompany the final remedial action.	Comment accepted. "A prefinal inspection will accompany the final remedial action:" has been added to the end of the first paragraph.
20	6.2.3.1	6-4	Third Sentence: Please provide more information on the "approved CERCLA waste storage area," or provide a reference where such information can be found.	The reader is referred to the Waste Management Plan for a description of the "approved CERCLA Waste Storage Area"

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DATE: March 28, 2003 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
21	6.2.3.3	6-8	It is recommended that a modified dynamic data collection strategy be utilized using systematic planning and innovative field-based measurement technologies. Real time field measurements will allow better decisions to be made in the field, which would be allowed by flexible dynamic data collection.	Comment accepted. A dynamic approach is being proposed in the Field Sampling Plan. The Field Sampling Plan is currently in agency review. Any changes to the plan will be reflected in the RD/RA WP summary of the FSP. The text in 6.2.3.3 has been re-written to indicate that the Phase II (drilling) locations will be based on the gamma survey. Cores will be collected from all boreholes. All cores will be gamma logged, and selection of sub-samples within each core for additional analysis will be based upon the logging results.
22	6.3	6-8	Second Paragraph: It is recommended that methods such as field screening (or analyzing swabs from the piping) be used to characterize the piping. If the piping is not contaminated, it may be more easily disposed of.	Comment noted. The piping is not being characterized for waste determination. The text will be clarified to state: "All piping and debris will be treated by macro encapsulation. Refer to the Waste Management Plan (DOE-ID 11050) for a description of characterization for ICDF inventory purposes. "
23	Table 6-2	6-12	Please add "LSA" to the list of acronyms.	Comment accepted.
24	8.0	8-1	It appears that there may be a problem with V-tanks ERA RD/RA WP language, specifically the last sentence of Section 8. The statement is "Completion of the final Remedial Action Report for the V-Tanks will trigger the beginning of the five-year review cycle." It appears to us that the cycle should have already been triggered by the Group 1 RA activities, and if not, the Five-Year Review guidance states that the cycle is initiated at sites where an RA is taking place by the date of the "actual RA on-site construction" or the "actual RA start". Either way, the RA Report for the V-tanks as a trigger for the cycle is way too late according to EPA guidance	Comment accepted. The current language is incorrect. The final Remedial Action Report will not trigger the five year reviews. They have already been triggered. Section 3.4 , Five Year Reviews, in the OU 1-10 O&M Plan, DOE/ID-10711, Revision 1, November 2001, correctly states that the first five year review will be conducted within five years of the start of remedial action construction. And based on the TSF-06 and 26 soil removal and disposal work that was initiated in 2000, the first five year review will be planned for 2005. Section 8 will be revised to state: "The original Group 2 RD/RAWP provides information on institutional controls, operation and maintenance, and five-year reviews. The early remedial action is only a portion of the V-Tank remedial action activities and does not affect previous planning for institutional controls, operation and maintenance, and five-year reviews."

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PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites (Draft)

DATE: 3/19/03 **REVIEWER:** EPA

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
GENERAL COMMENTS				
SPECIFIC COMMENTS				
1	2.2	2-1	It is not clear if the pipe(s) leading **to** V-9 will be inspected for standing liquid/debris as well as the pipe(s) leading **from** V-9 to Building 616. The text should be revised to clarify this.	Comment accepted. To clarify that this is the same pipe, The first sentence in the second paragraph has been changed to: "Flushing the pipes between the V-9 tank and TAN 616"...Also, a reference to Figure 6-2 has been added to the paragraph.
2	4.1.1	4-2	What impact to cost and schedule will there be if these assumptions are incorrect, for example, if the as built drawings are not accurate?	Comment noted. No change to text. We have planned the work based on available information and there is a basis for the assumptions (e.g., criticality evaluation). The design and implementation approach is based on these assumptions. Cost and schedule impacts would vary depending on which assumption was violated.
3	6.2.3.3	6-8	Bullets 2 and 3: It is not clear how Phase II and Phase III drilling are related. Is additional drilling required at adjacent locations for Phase III or just additional analysis of the samples collected during the Phase II drilling.	Comment accepted. The Field Sampling Plan is currently in agency review. Any changes to the plan will be reflected in the RD/RA WP summary of the FSP. The text in 6.2.3.3 has been re-written to indicated that the Phase II (drilling) locations will be based on the gamma survey. Cores will be collected from all boreholes. All cores will be gamma logged, and selection of sub-samples within each core for additional analysis will be based upon the logging results.

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DATE: 3/19/03 **REVIEWER:** EPA

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
4	6.3	6-8	First Paragraph, last sentence: EPA recommends that the last part of this sentence read ". . . or (4) an industrial landfill (e.g. Central Facilities Area Landfill)."	Comment accepted. "on Site" has been deleted from the sentence.
5	6.3	6-9	1st parg. Is this paragraph necessary? If not, EPA recommends deleting it. If it must remain, EPA recommends the following edits: 1) Add a definition of the area of concern at the beginning of paragraph such as was added to a similar statement in the 1-07B ROD. The definition is "The area of concern (AOC), for waste management purposes, will be defined as the area of contamination and the area nearby related to the remedial action." 2) Revise the last sentence to read ". . . area of contamination will be required to meet the land disposal restriction standards before disposal. DOE will comply with the requirements of the Off Site Rule as applicable." 3) Revise the next to last sentence to read ". . . within the INEEL Site or sent off the INEEL Site for storage . ." 4) Where does the FFA/CO define the entire CERCLA site area as a site for waste management purposes? If the FFA/CO does not provide such a definition then the statement should be rewritten.	Comment accepted, paragraph deleted.

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DATE: 3/19/03 **REVIEWER:** EPA

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
6	Table 6-2	6-10	It is not clear how another facility besides the ICDF is determined to be an approved facility. EPA assumes the facility will be approved by the Agencies. To gain EPA's approval, EPA expects documentation that the waste meets the acceptance criteria of the receiving facility, whether the waste will adversely affect the environment at the facility, how any releases from the waste would be monitored/addressed, and whether such disposal is protective of human health and the environment. Such criteria should be included in the RD/RA work plan	The words "Envirocare, or other approved facility" have been replaced by a footnote to the table "ICDF is the planned disposal facility. If, however, the waste cannot meet the ICDF it will be disposed to another facility, such as Envirocare."
7		B-3	Appendix B, Introduction: . The first paragraph states that the cost in this Appendix include costs associated only with the RD/RA for the early action. The second sentence of the third paragraph states that actual costs through September 2003 have been included in the estimate. Are the costs presented in this section related to just the early action RD/RA or costs associated with all Group 2 actions?	The costs presented in this section are related to just the early action RD/RA WP.
8	Table B-1	B-4	This table summaries the cost of the early remedial action. The subcategories include the Area of Contamination Soil Sampling. It is not clear where the cost of the preliminary surface soil gamma survey is noted in this subcategory.	The table has been revised itemized cost for each phase of the ERA.

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DATE: 3/19/03 **REVIEWER:**	**EPA**

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
9	Table 2-1	2-5	Typo: The text in the control column crossed with the "Use and Management of Containers" row contains a couple extraneous punctuation marks.	Comment accepted, typo corrected.
10	B-1.4	B-5	Typo: Bullet 1. This sentence is confusing. Perhaps the bullet should be written to read; "Gross gamma survey of the surficial soil of a large area."	Comment accepted, typo corrected.

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PROJECT DOCUMENT REVIEW RECORD

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DATE: May 22, 2003 **REVIEWER:** DOE

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
GENERAL COMMENTS				
			Global comment – Following detailed work planning for isolation of Tank V-9, it is recommended that the piping from Tank V-9 to TAN-616 not be removed at this time. Liquid present in the line complicates the work effort. Removal of the liquid and this section of piping is better accomplished later during subsequent remedial action work.	The document will be revised to indicate that only line isolation will occur between Tank V-9 and TAN-616.
			Global comment – Following detailed work planning for isolation of Tank V-9, it is recommended that the inlet piping be isolated at the present terminal end of the piping just inside valve pit 1704.	The document will be revised to indicate that D&D/ VCO activities for removal of the 1704 valve pit will leave this short piece of piping in place to be managed under the V-Tank remediation project.
			Global comment- following detailed work planning for ERA it is recommended that the sand filter be relocated within the present AOC for disposition with waste generated following the V-Tank remediation process.	The document will be revised to indicate that the sand filter will be relocated within the AOC prior to V-9 isolation and will be disposition later during the V-Tank remediation process.
SPECIFIC COMMENTS				